

HALLIBURTON

ARRAY COMPENSATED  
TRUE RESISTIVITY  
SPECTRAL DENSITY  
DUAL SPACED NEUTRON

COMPANY		NOBLE ENERGY INC	
WELL		JEANIE AB10-01R	
FIELD/BLOCK		TOM CAT	
COUNTY		WELD	
STATE		CO	
Permanent Datum		GL	
Log measured from		KB	
Drilling measured from		KB	
Date		14-Dec-12	
Run No.		ONE	
Depth - Driller		9027.00 ft	
Depth - Logger		9020.0 ft	
Bottom - Logged Interval		9018 ft	
Top - Logged Interval		CASING	
Casing - Driller		9.625 in @ 884.0 ft	
Casing - Logger		883.0 ft	
Bit Size		8.750 in @	
Type Fluid in Hole		WATER BASED MUD	
Density		8.6 ppq 33.00 s/qt	
PH		10.50 pH 8.2 cp/m	
Source of Sample		FLOW LINE	
Rm @ Meas. Temperature		0.522 ohmm @ 58.80 degF @	
Rmf @ Meas. Temperature		0.78 ohmm @ 46.00 degF @	
Rmc @ Meas. Temperature		0.824 ohmm @ 49.50 degF @	
Source Rmf		Rmc MEASURED MEASURED	
Rm @ BHT		0.14 ohmm @ 238.0 degF @	
Time Since Circulation		8.7 hr	
Time on Bottom		14-Dec-12 10:15	
Max. Rec. Temperature		238.0 degF @ 9020.0 ft @	
Equipment		11454566 BRIGHTON	
Recorded By		R. TWEEETEN	
Witnessed By		J. TAYLOR	
A. TIPTON			

COMPANY	NOBLE ENERGY INC
WELL	JEANIE AB10-01R
FIELD/BLOCK	TOM CAT
COUNTY	WELD
STATE	CO
API No.	05123362620000
Location	SURFACE LOCATION: 1.440 FNL & 780' FEL SENE
LATITUDE: 40.590930°	
LONGITUDE: -104.528660°	
Other Services:	RWCH
	CSNG
	HFDI
	ICT

Fold here

Service Ticket No.: 900048332				API Serial No.: 05123362620000				PGM Version: WL INSITE R3.8.0 (Build 2)							
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE						RESISTIVITY SCALE CHANGES									
Date		Sample No.				Type Log		Depth		Scale Up Hole		Scale Down Hole			
Depth-Driller															
Type Fluid in Hole															
Density		Viscosity													
Ph		Fluid Loss													
Source of Sample						RESISTIVITY EQUIPMENT DATA									
Rm @ Meas. Temp		@		@		Run No.		Tool Type & No.		Pad Type		Tool Pos.		Other	
Rmf @ Meas. Temp.		@		@		ONE		ACRt		N/A		FREE		N/A	
Rmc @ Meas. Temp.		@		@				11302817							
Source Rmf		Rmc						11294353							
Rm @ BHT		@		@											
Rmf @ BHT		@		@											
Rmc @ BHT		@		@											
EQUIPMENT DATA															
GAMMA				ACOUSTIC				DENSITY				NEUTRON			
Run No.		ONE		Run No.				Run No.		ONE		Run No.		ONE	
Serial No.		11277436		Serial No.				Serial No.		11795867		Serial No.		11812167	
Model No.		GTET		Model No.				Model No.		SDLT		Model No.		DSNT	
Diameter		3.625"		No. of Cent.				Diameter		4.5"		Diameter		3.625"	
Detector Model No.		GTET		Spacing				Log Type		GAM-GAM		Log Type		NEU-NEU	
Type		SCINT						Source Type		Cs-137		Source Type		Am241Be	
Length		8"		LSA [Y/N]				Serial No.		5471GW		Serial No.		DSN434	
Distance to Source		17'		FWDA [Y/N]				Strength		1.78 Ci		Strength		15 Ci	
LOGGING DATA															

Depth (ft))	Tool Name	Mnemonic	Description	Value	Units
TOP					
	DSNT	NLIT	Neutron Lithology	Sandstone	
	SDLT Pad	DMA	Formation Density Matrix	2.680	g/cc
	HFDT-I	MDIL	Matrix Dielectric Constant	4.650	
6600.00					
	DSNT	NLIT	Neutron Lithology	Limestone	
	SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
	HFDT-I	MDIL	Matrix Dielectric Constant	8.000	
7000.00					
	SDLT Pad	DMA	Formation Density Matrix	2.680	g/cc
7274.00					
	SHARED	BS	Bit Size	8.750	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	8.600	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	900.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	0.522	ohmm
	SHARED	TRM	Temperature of Mud	58.8	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	7.000	in

SHARED	ST	Surface Temperature	40.0	degF
SHARED	TD	Total Well Depth	9020.00	ft
SHARED	BHT	Bottom Hole Temperature	238.0	degF
SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
SHARED	TEMM	Temperature Master Tool	NONE	
SHARED	BHSM	Borehole Size Master Tool	ICT	
Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
Rwa / CrossPlot	AFAC	Archie A factor	0.6200	
Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GRSO	Gamma Tool Standoff	0.000	in
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
CSNG	CGOK	Process CSNG Data?	Yes	
CSNG	CENT	Is Tool Centralized?	No	
CSNG	GBOK	Gamma Enviromental Corrections?	Yes	
CSNG	BARF	Barite Correction Factor	1.00	
CSNG	ORDG	Use Fixed Gain	No	
CSNG	ORDO	Use Fixed Offset	No	
CSNG	ORDR	Use Fixed Resolution Degradation Factor	No	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Sandstone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
DSNT	DNTP	Temperature Correction Type	None	
DSNT	DPRS	DSN Pressure Correction Type	None	
DSNT	SHCO	View More Correction Options	No	
DSNT	UTVD	Use TVD for Gradient Corrections?	No	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	No	
SDLT Pad	CB	Logging Calibration Blocks?	No	
SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.650	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
HFDT-I	HFOK	Do HFDT Calculations?	Yes	
HFDT-I	RMF	Mud Filtrate Resistivity	0.77	ohmm
HFDT-I	RMFT	Temperature of Mud Filtrate	46.00	degF
HFDT-I	MDIL	Matrix Dielectric Constant	4.650	
HFDT-I	HRTC	HFDT Insite Temperature Correction Source	PADTEMP1	
HFDT-I	CLOK	Process Caliper Outputs?	Yes	
HFDT-I	SAO	SDL Backup Arm Offset	0.00	in
HFDT-I	PAO	Pad Arm Offset	0.00	in
HFDT-I	MLOK	Process MicroLog Outputs?	No	
HFDT-I	MINO	Microlog Lateral Offset	0.00	ohmm

HFDT-I	MNOO	Microlog Normal Offset	0.00	ohmm
ICT	CLOK	Process Caliper Outputs?	Yes	
ICT	DARM	Disable Caliper Arm	No	
ICT	ATDS	Arm To Disable	0	
ICT	REPM	Method to replace arm?	Caliper Average	
ICT	ARMV	Diameter to use for disabled arm	0.00	in
ICT	DARM	Disable Second Caliper Arm	No	
ICT	ATDS	Second Arm To Disable	0	
ICT	REPM	Method to replace second arm?	Caliper Average	
ICT	ARMV	Diameter to use for second disabled arm	0.00	in
ICT	CL1O	Radius 1 Offset	0.0	in
ICT	CL2O	Radius 2 Offset	0.0	in
ICT	CL3O	Radius 3 Offset	0.0	in
ICT	CL4O	Radius 4 Offset	0.0	in
ICT	CL5O	Radius 5 Offset	0.0	in
ICT	CL6O	Radius 6 Offset	0.0	in
ICT	BHVC	Radius type for borehole volume calcuations	Elliptical	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.25	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Up	
ACRt Sonde	TPOS	Tool Position	Free Hanging	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm
BOTTOM				

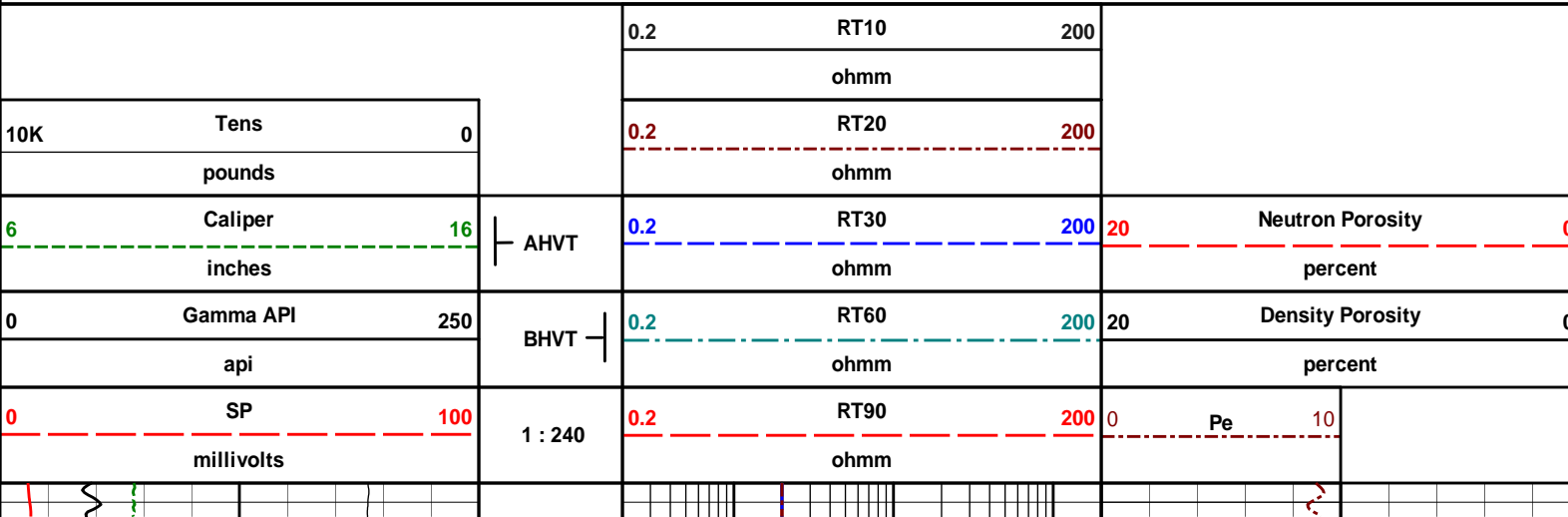
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Date: 14-Dec-12 13:34:27

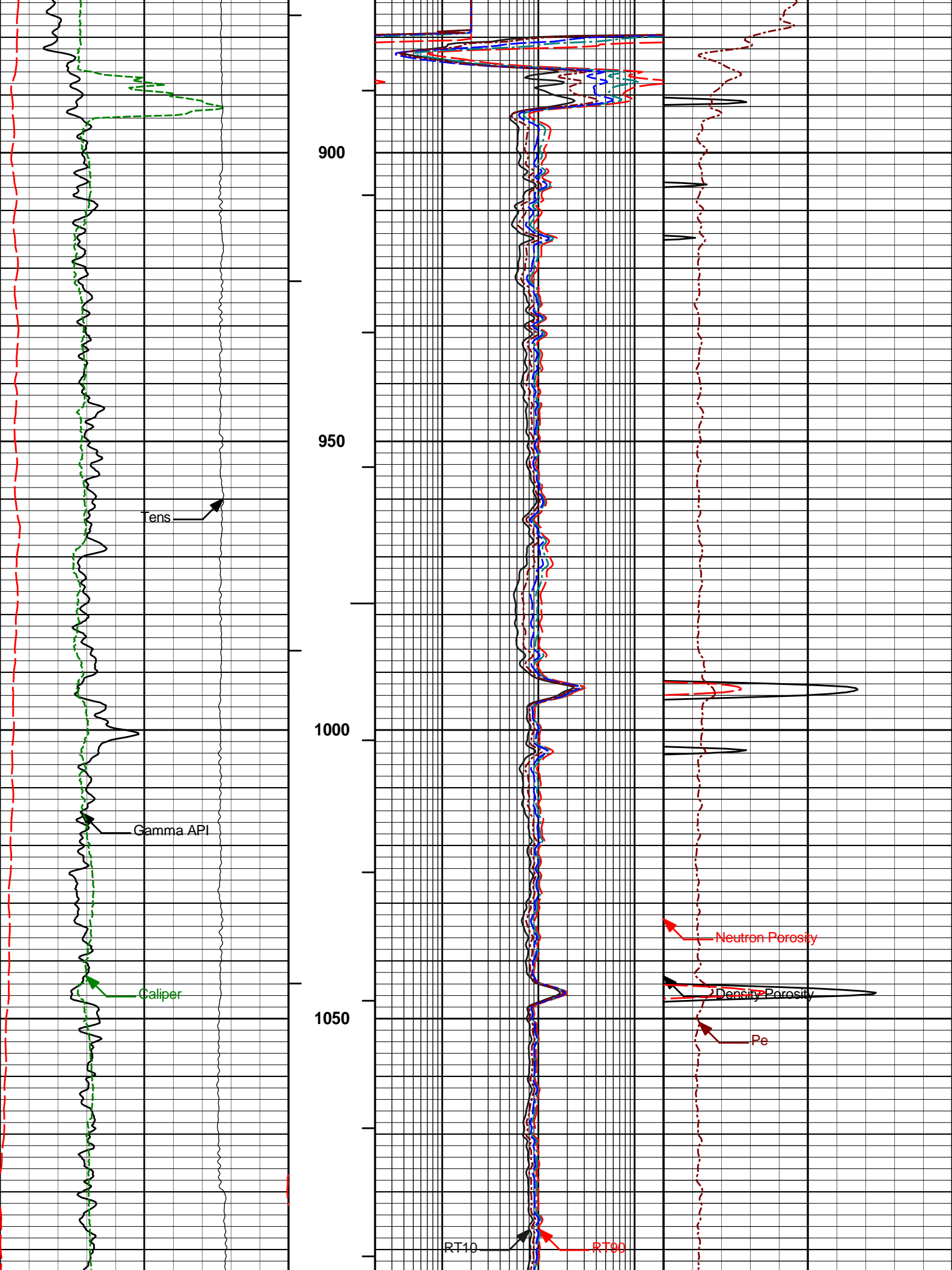
HALLIBURTON

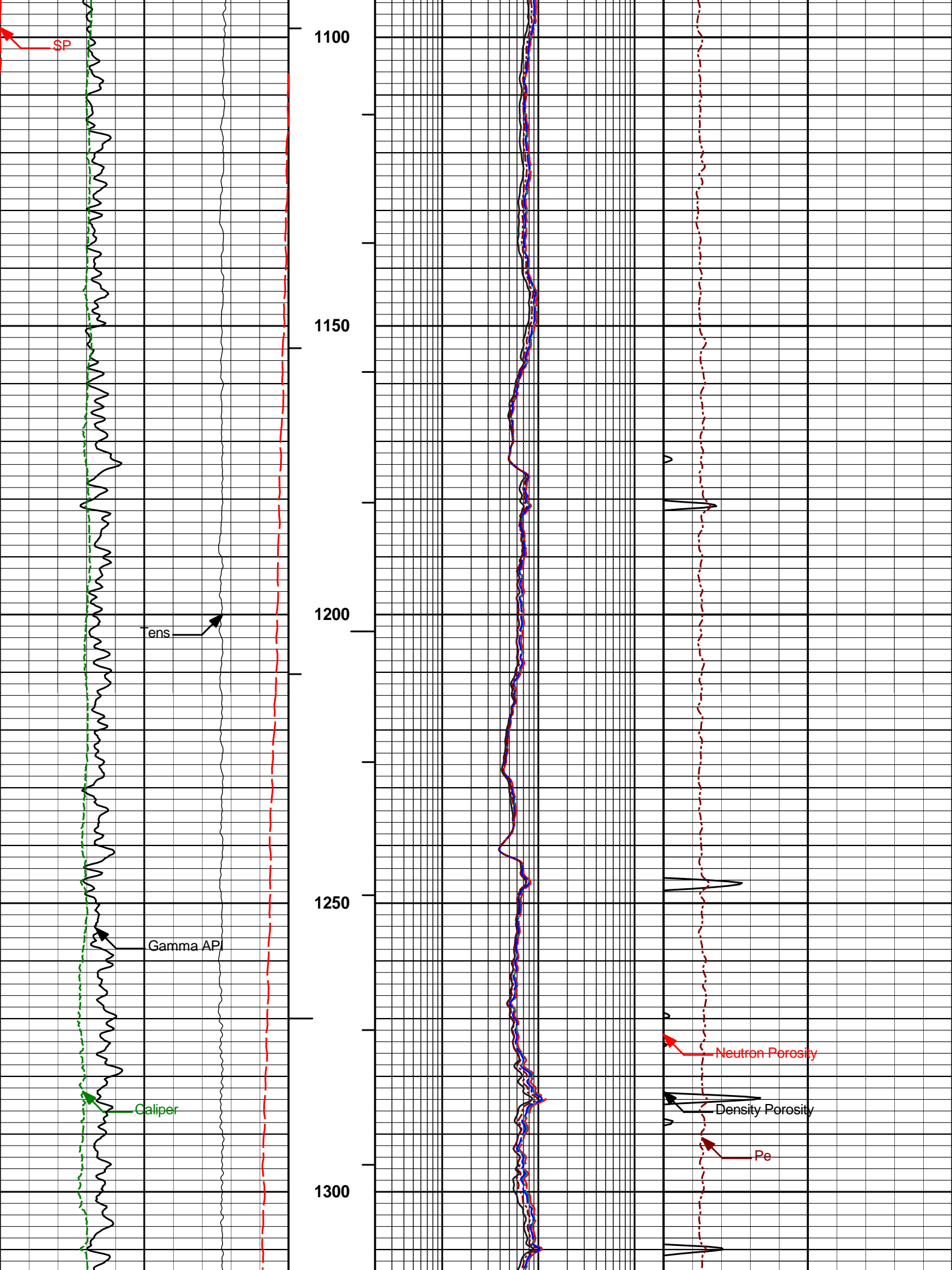
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Plot Range: 870 ft to 9025.67 ft  
Data: JEANIE\_AB10-01R\Well Based\MAIN\*  
Plot File: \COMP\MAIN

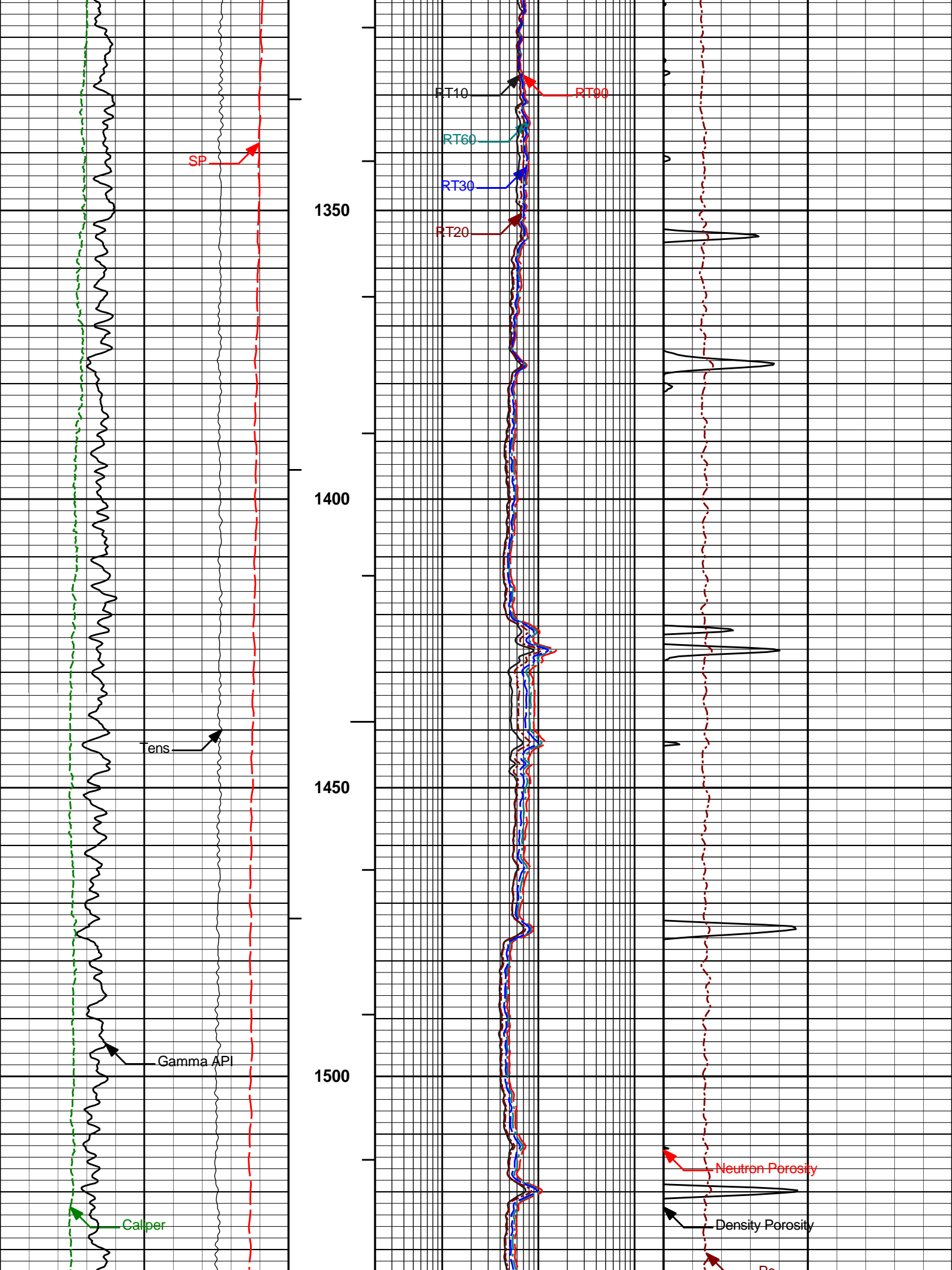
MAIN PASS 5" = 100'

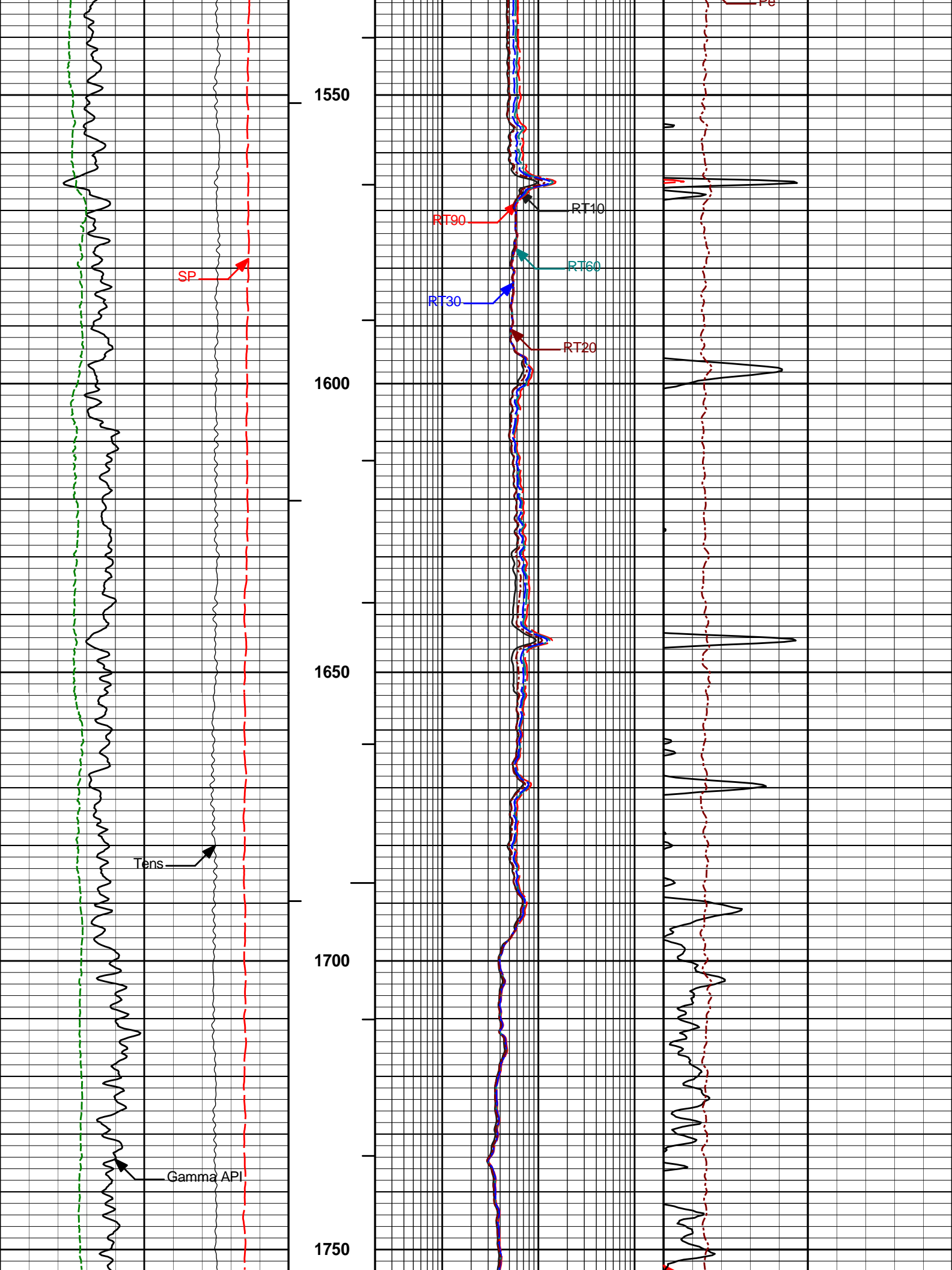


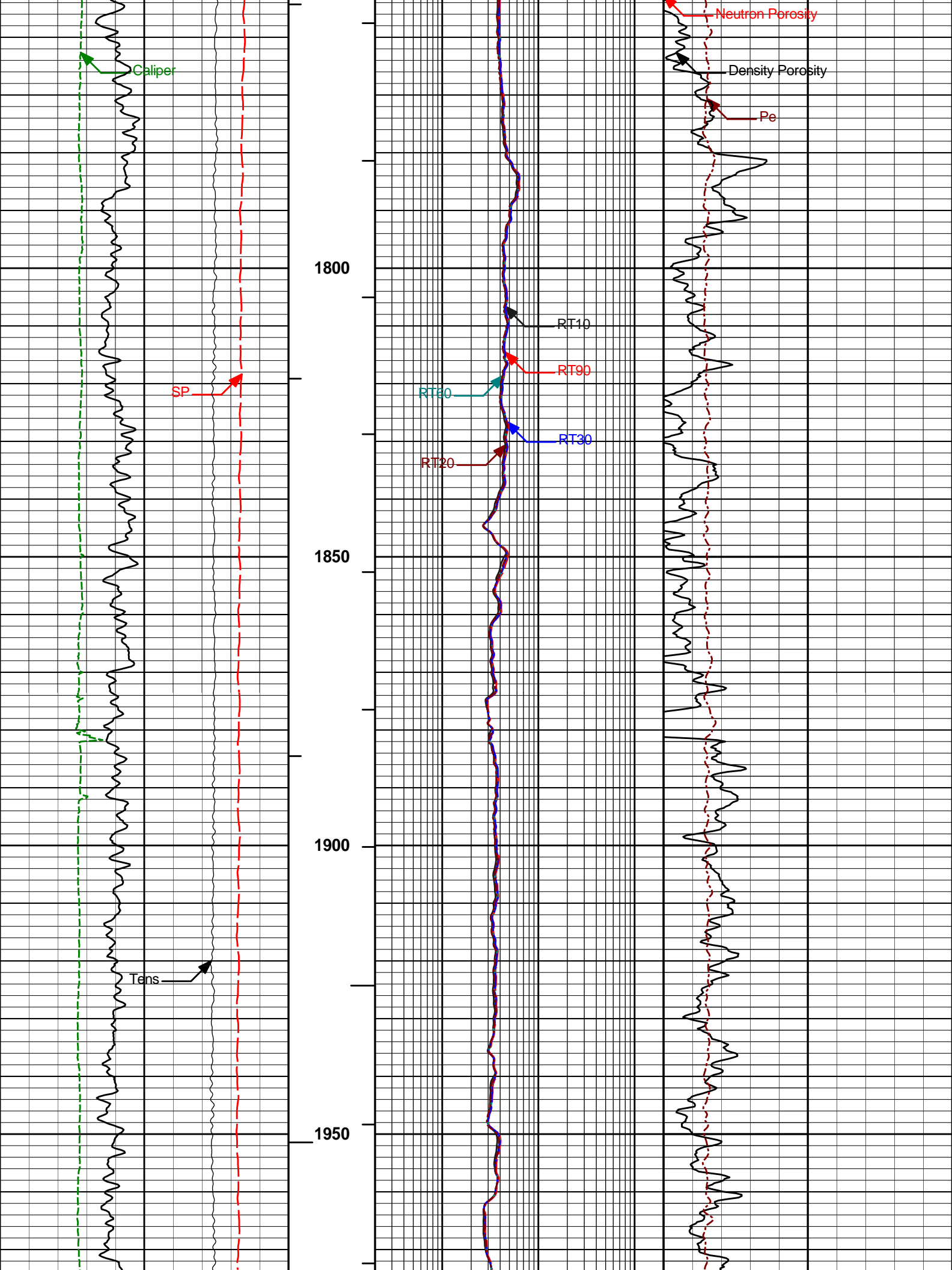


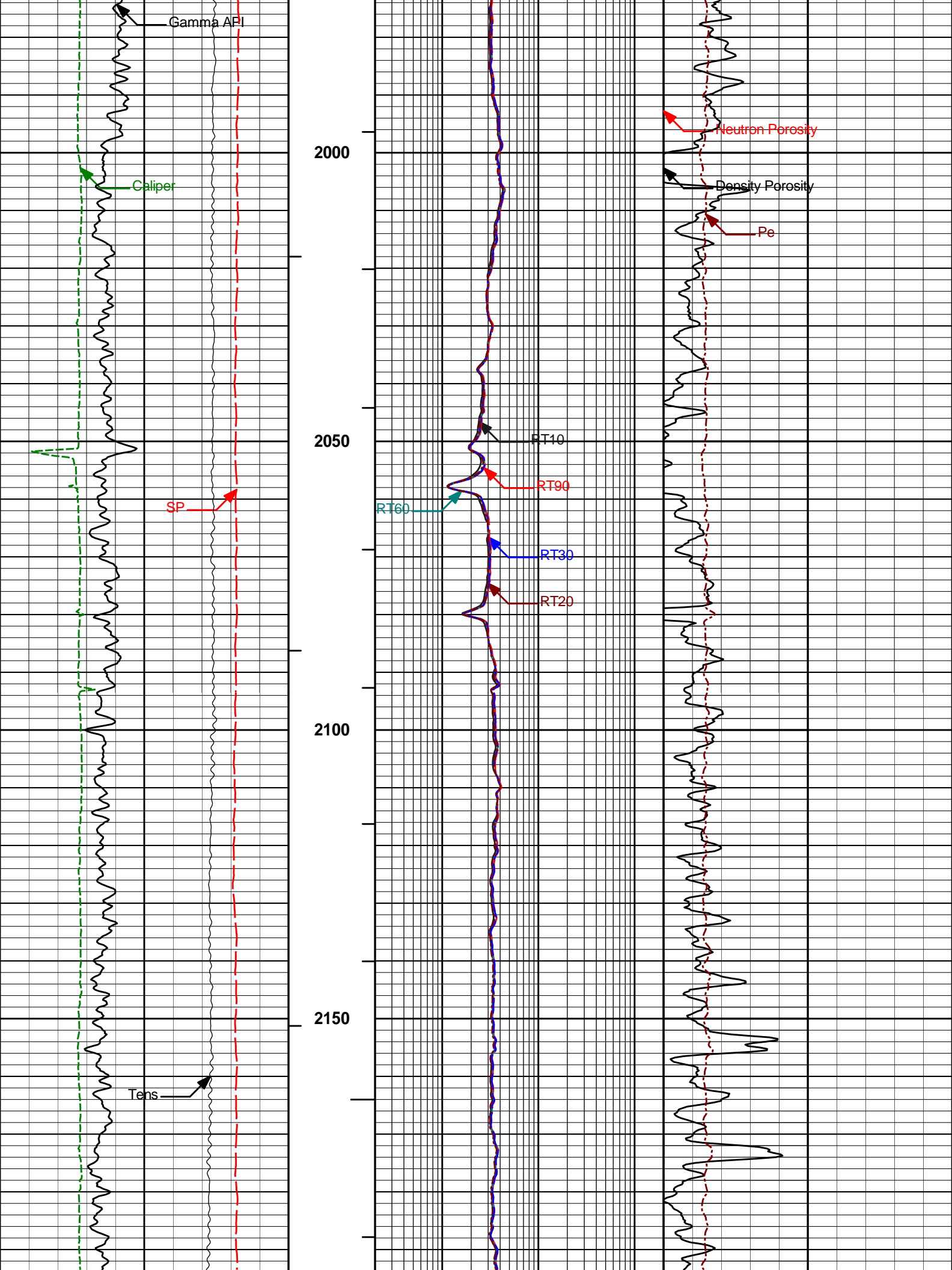


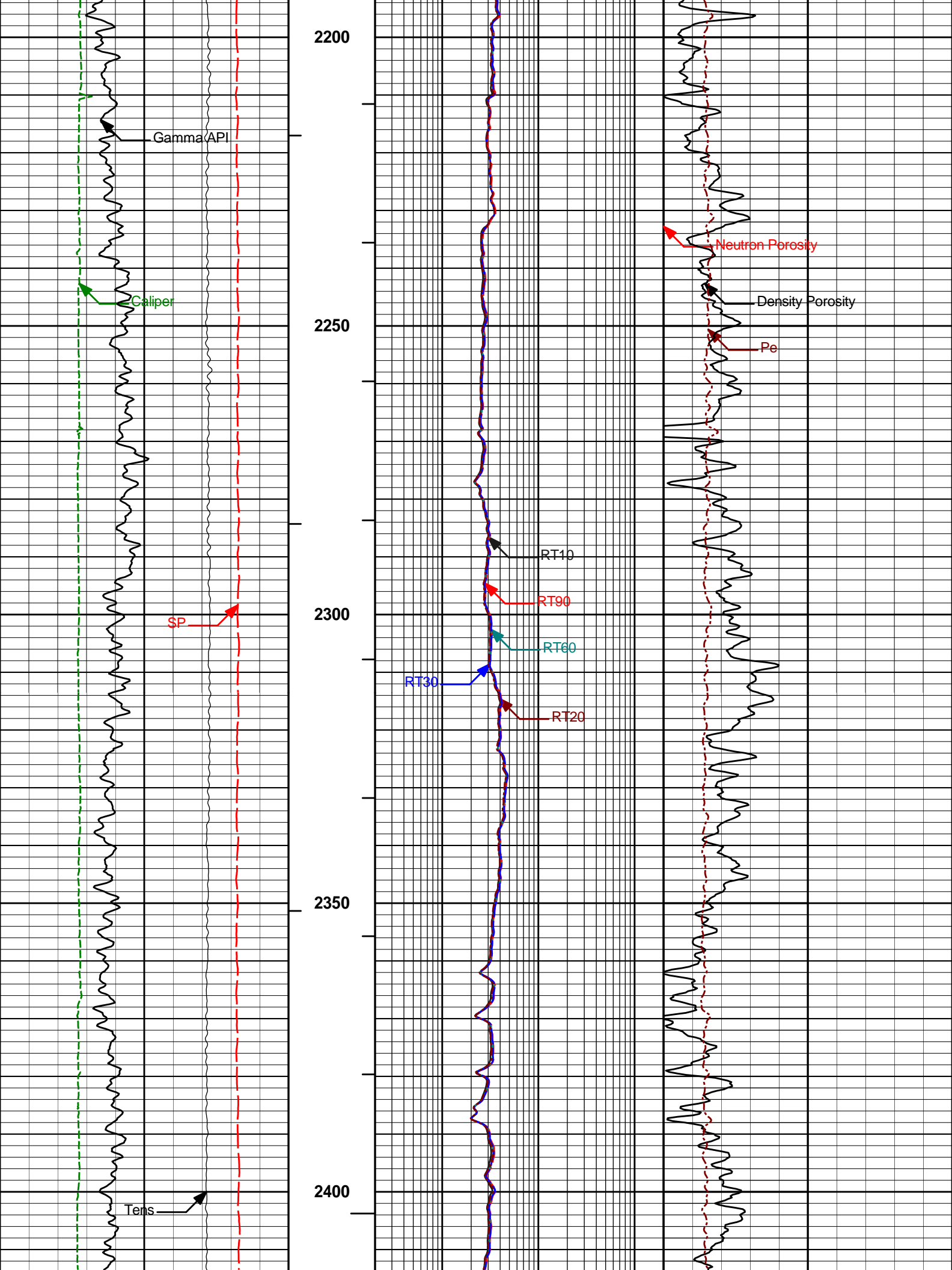


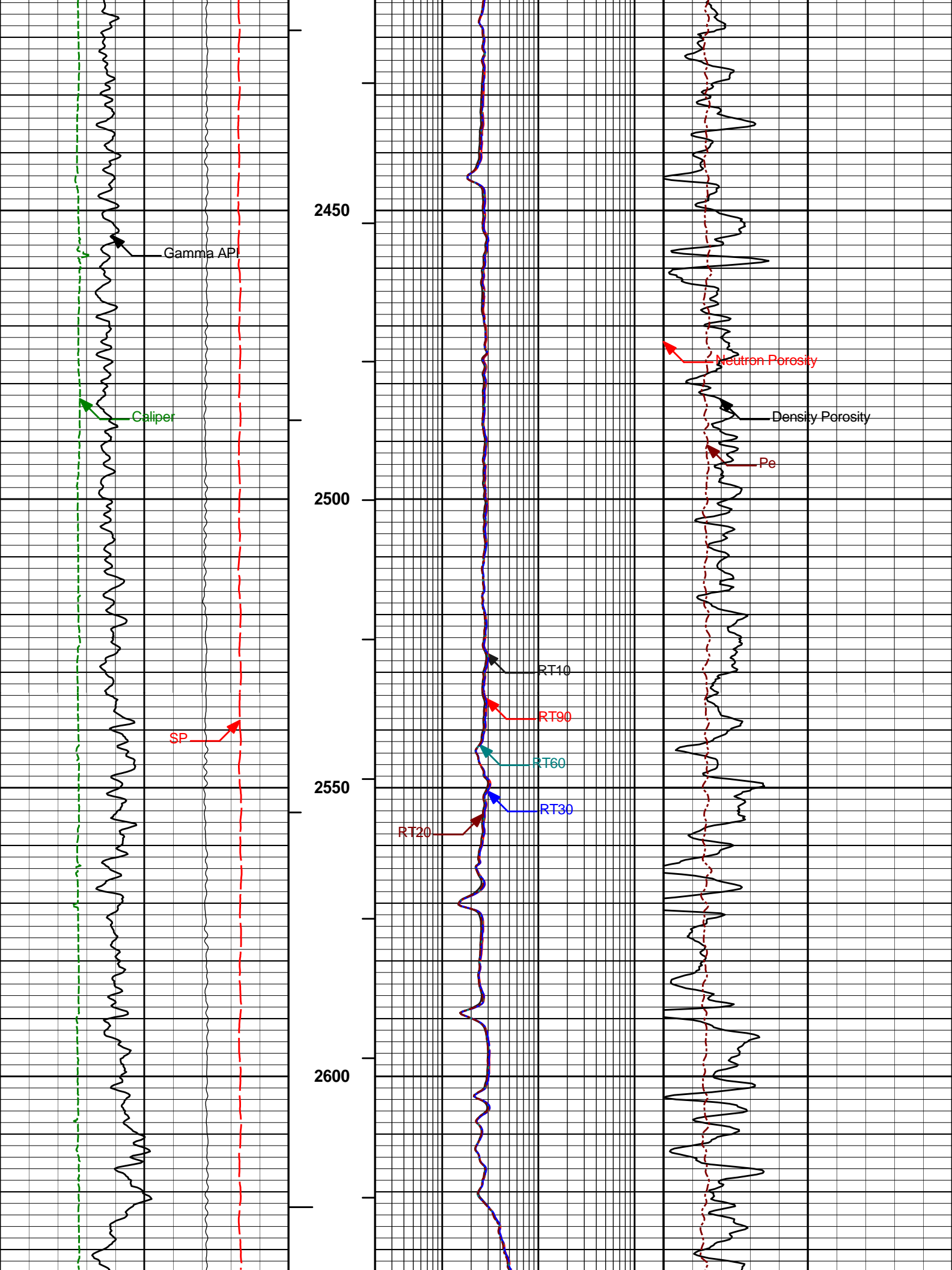




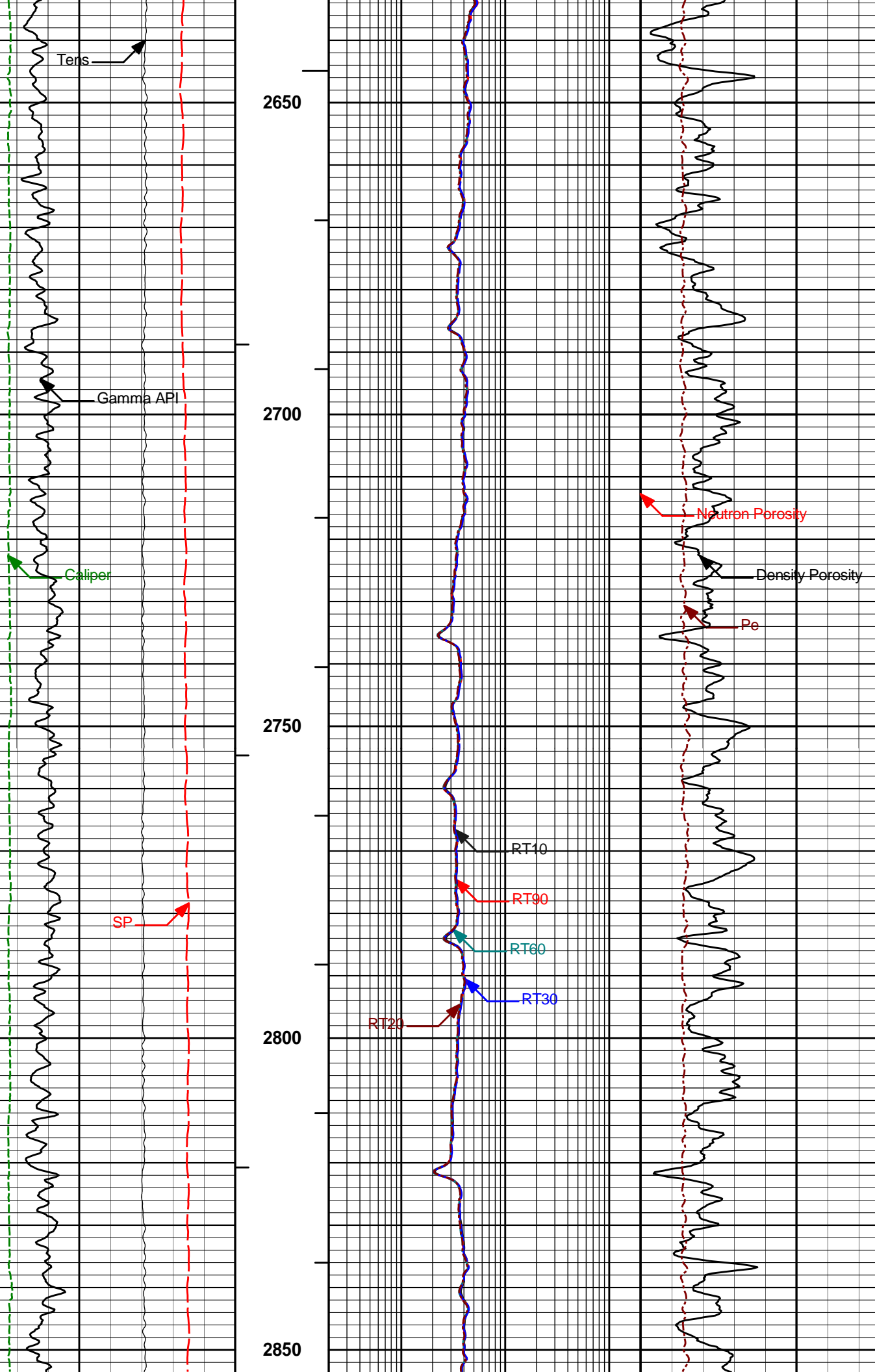


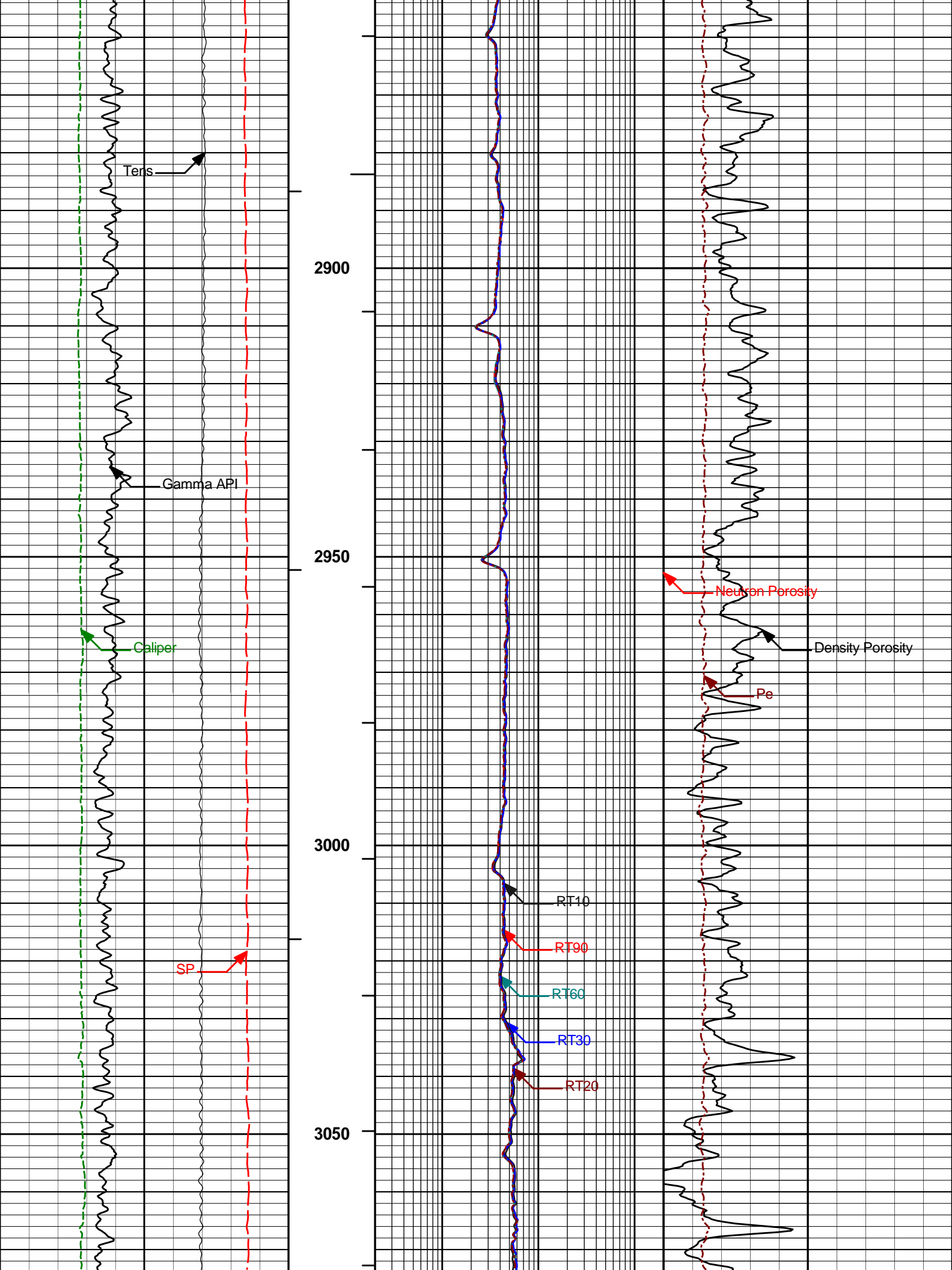


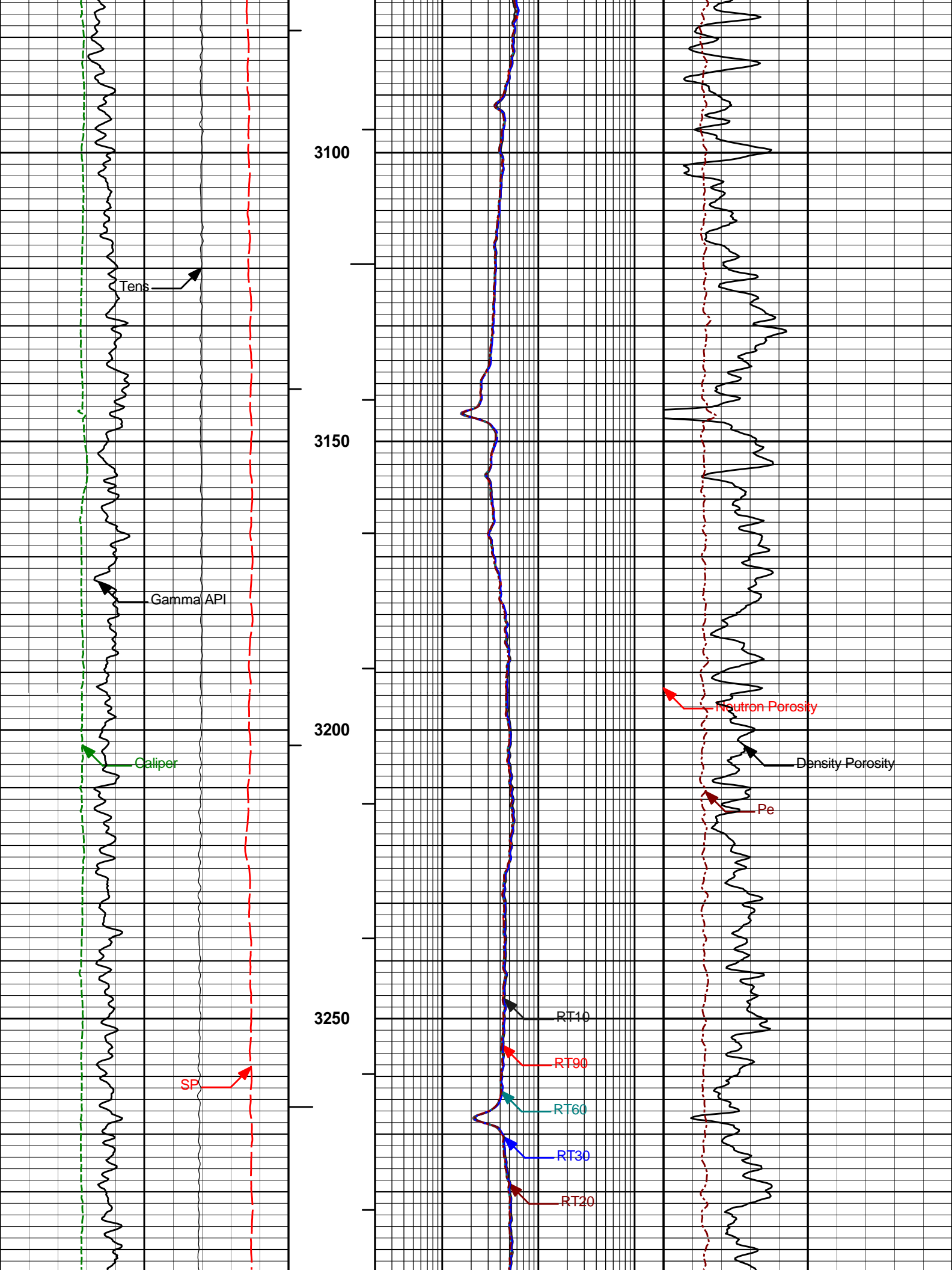


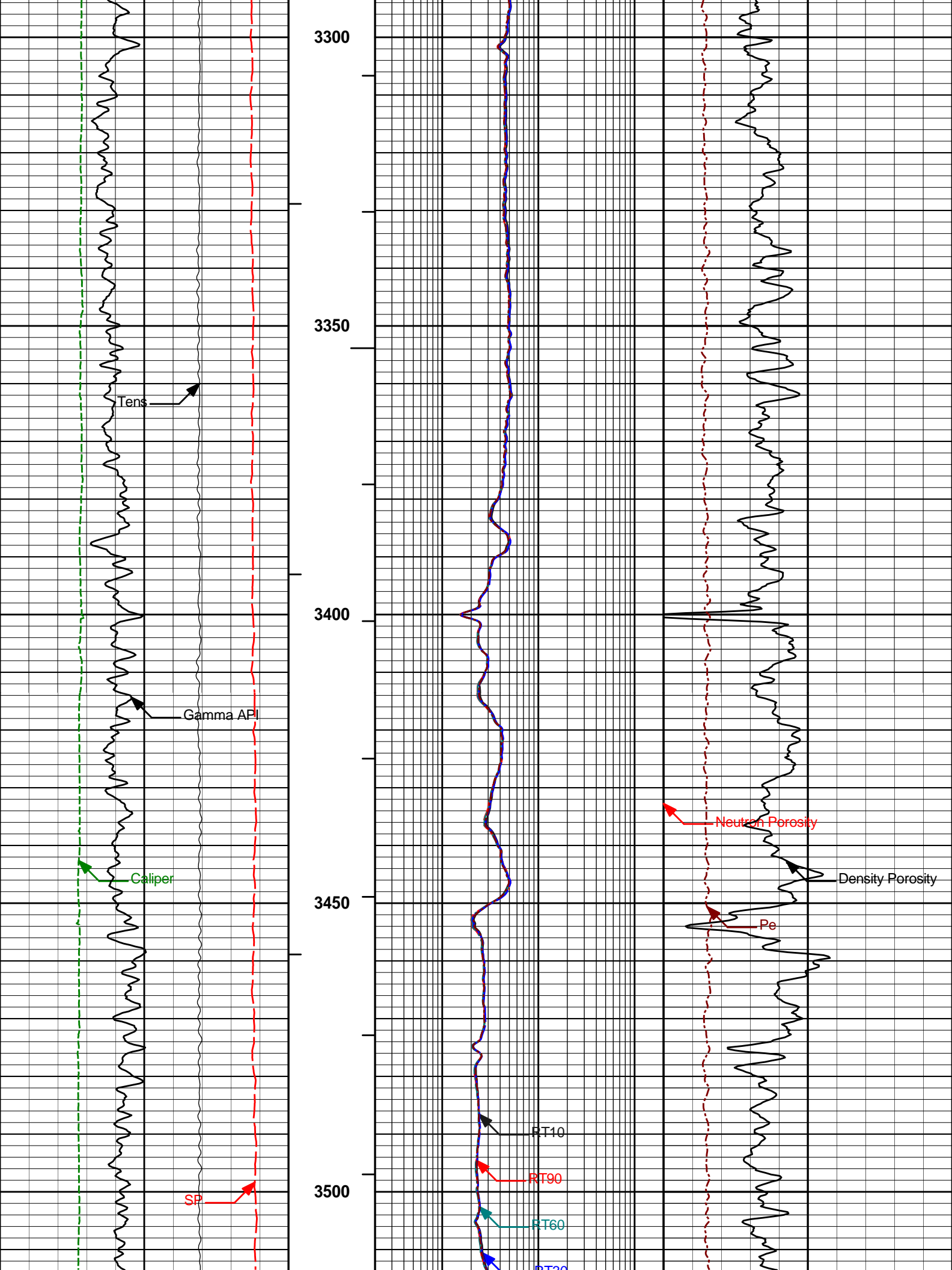


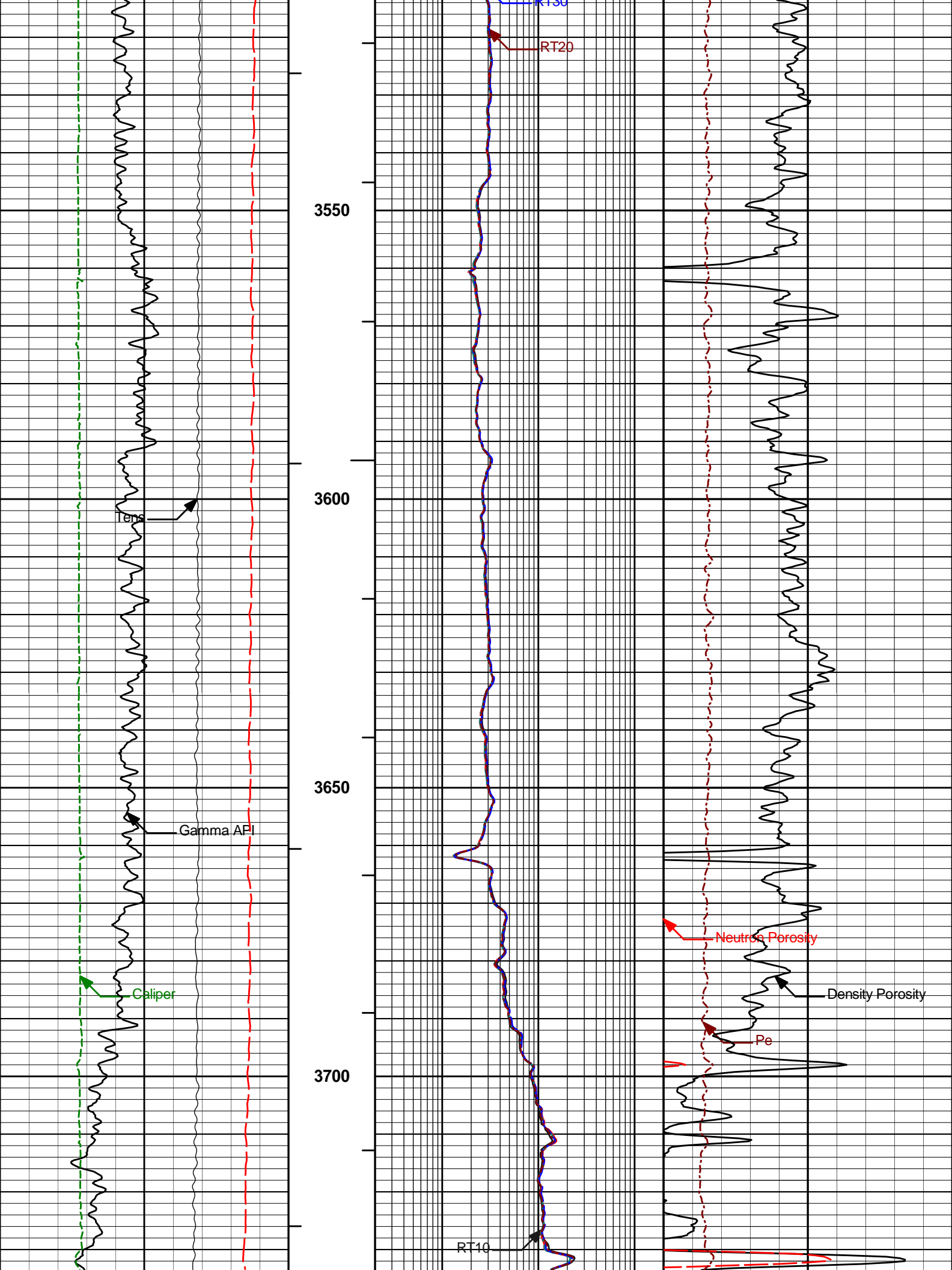


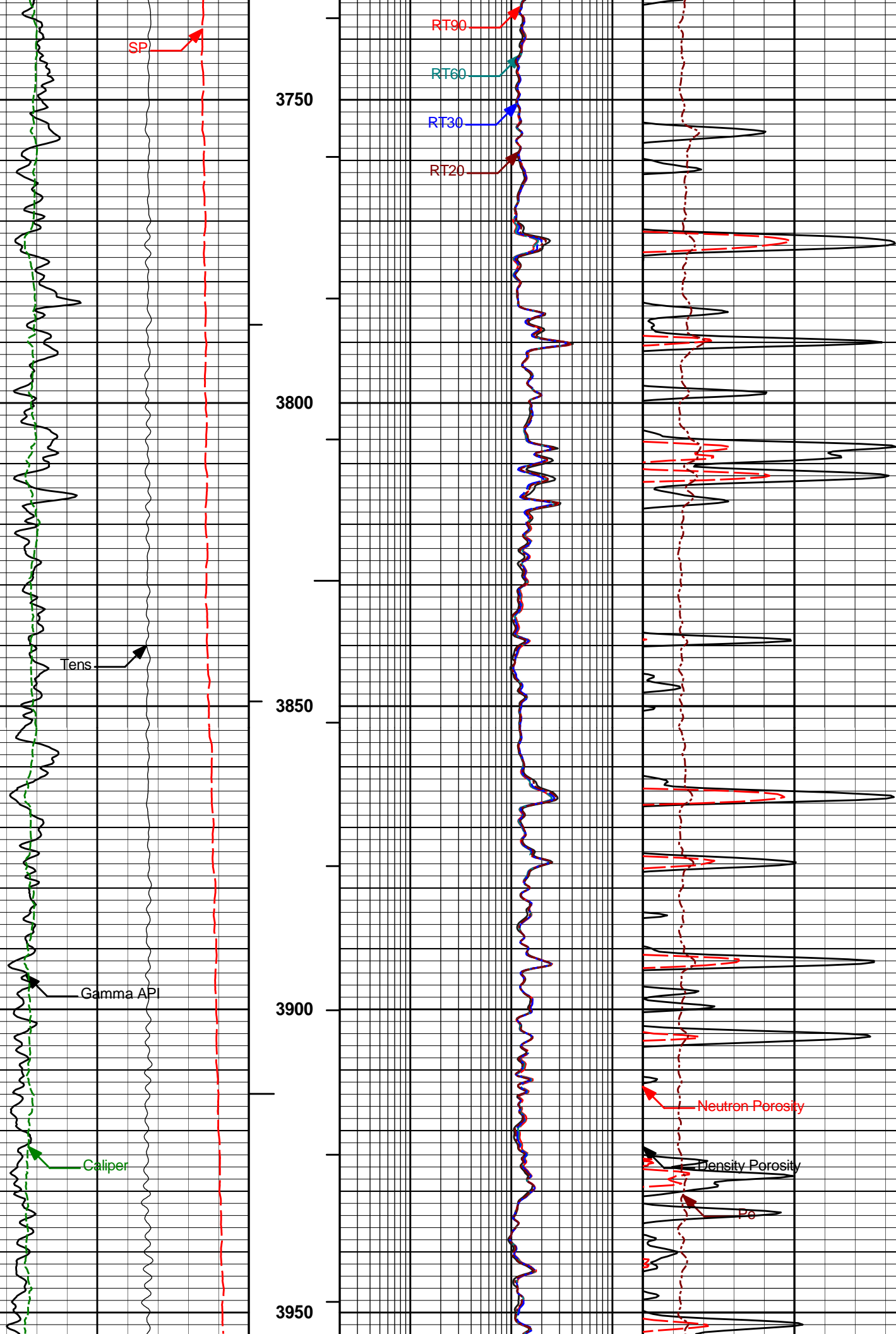


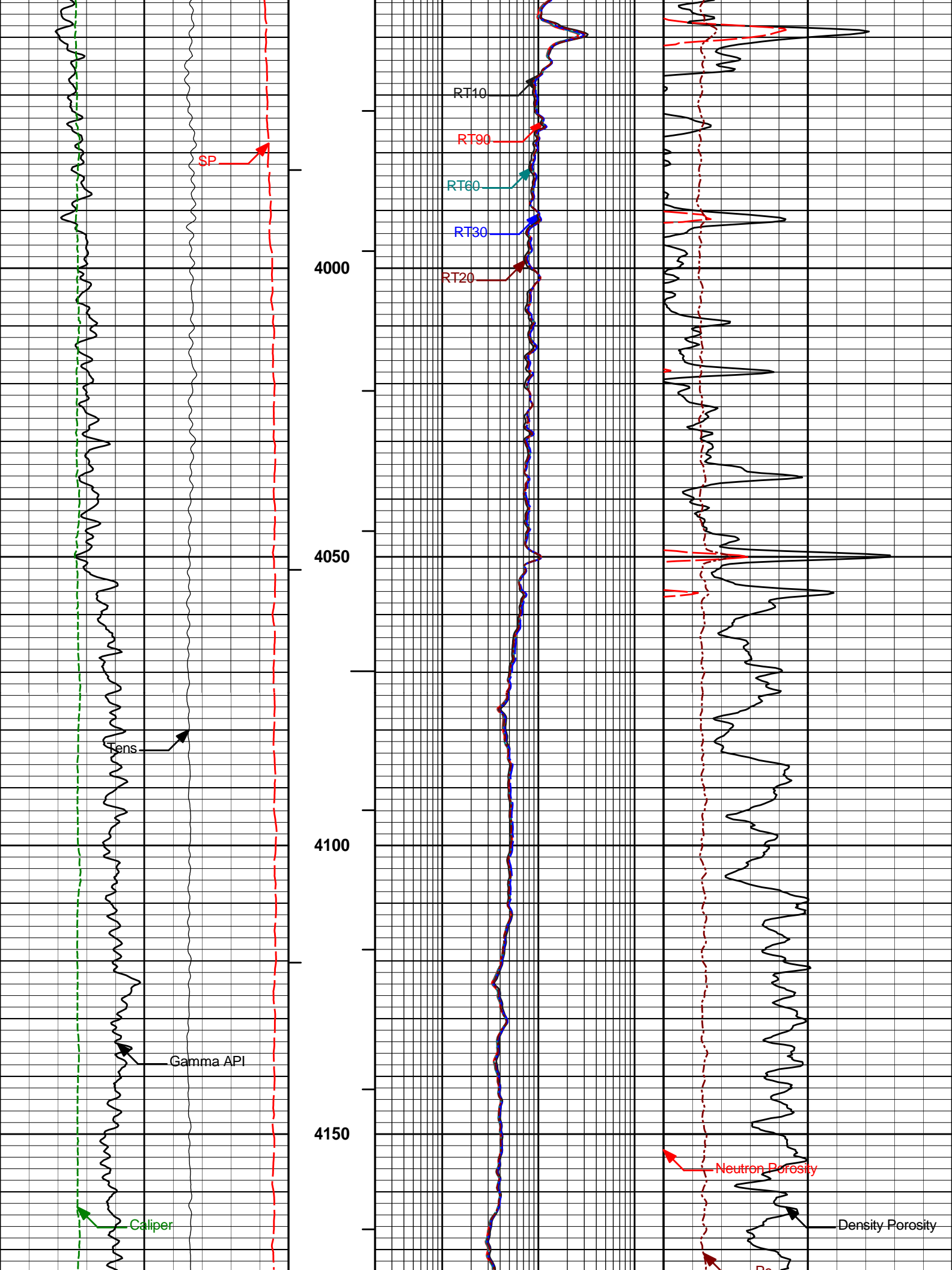


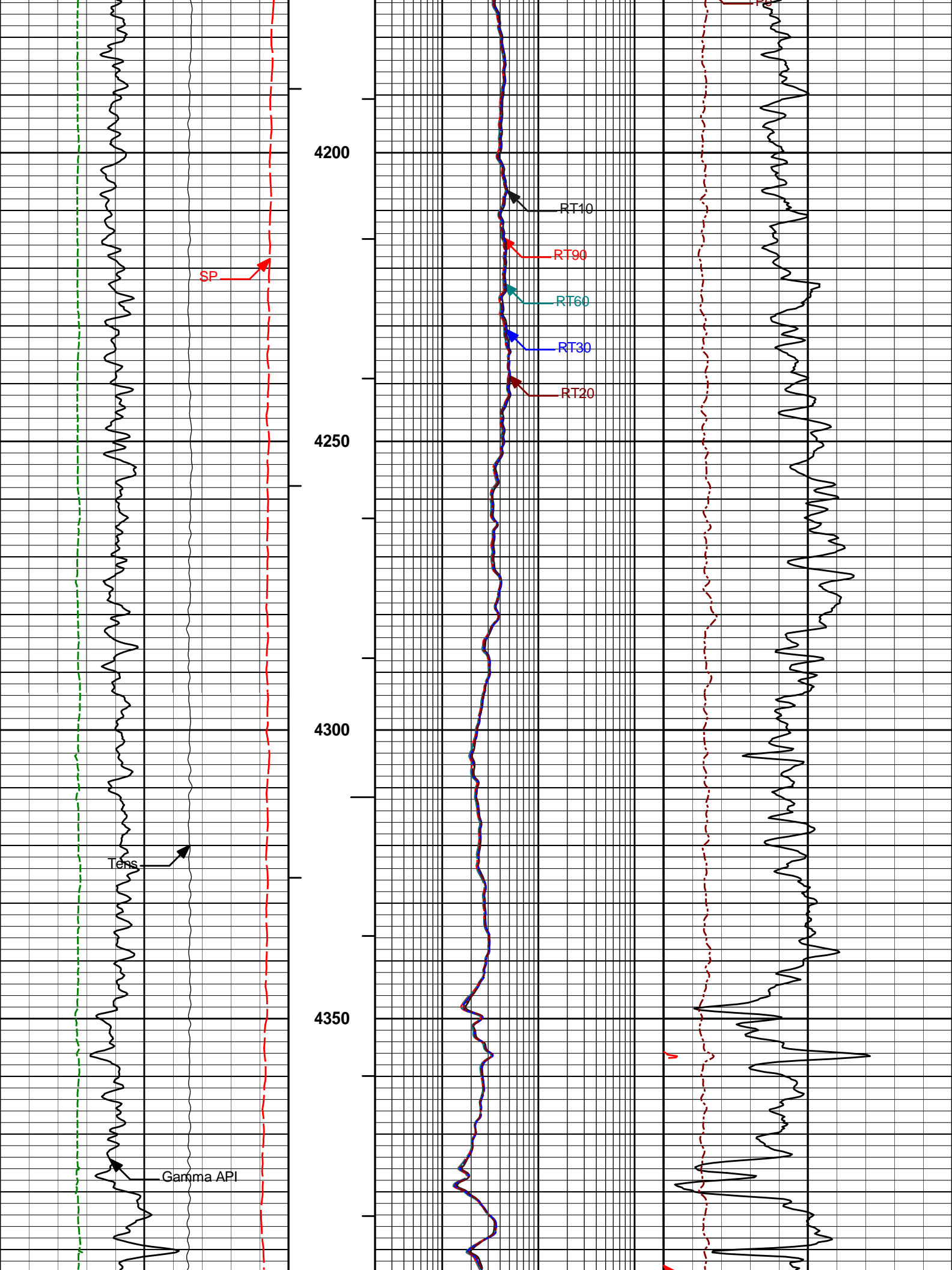




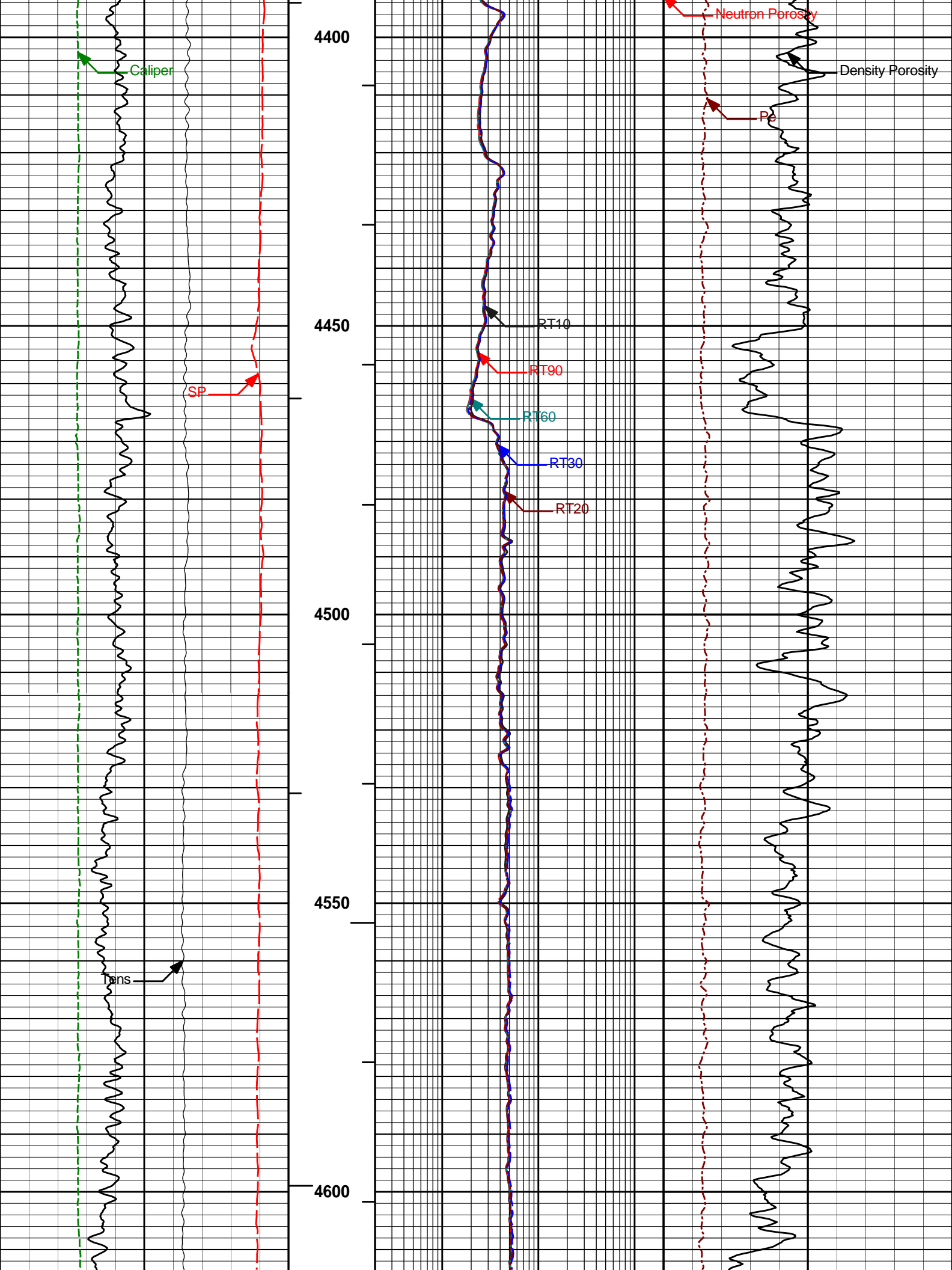


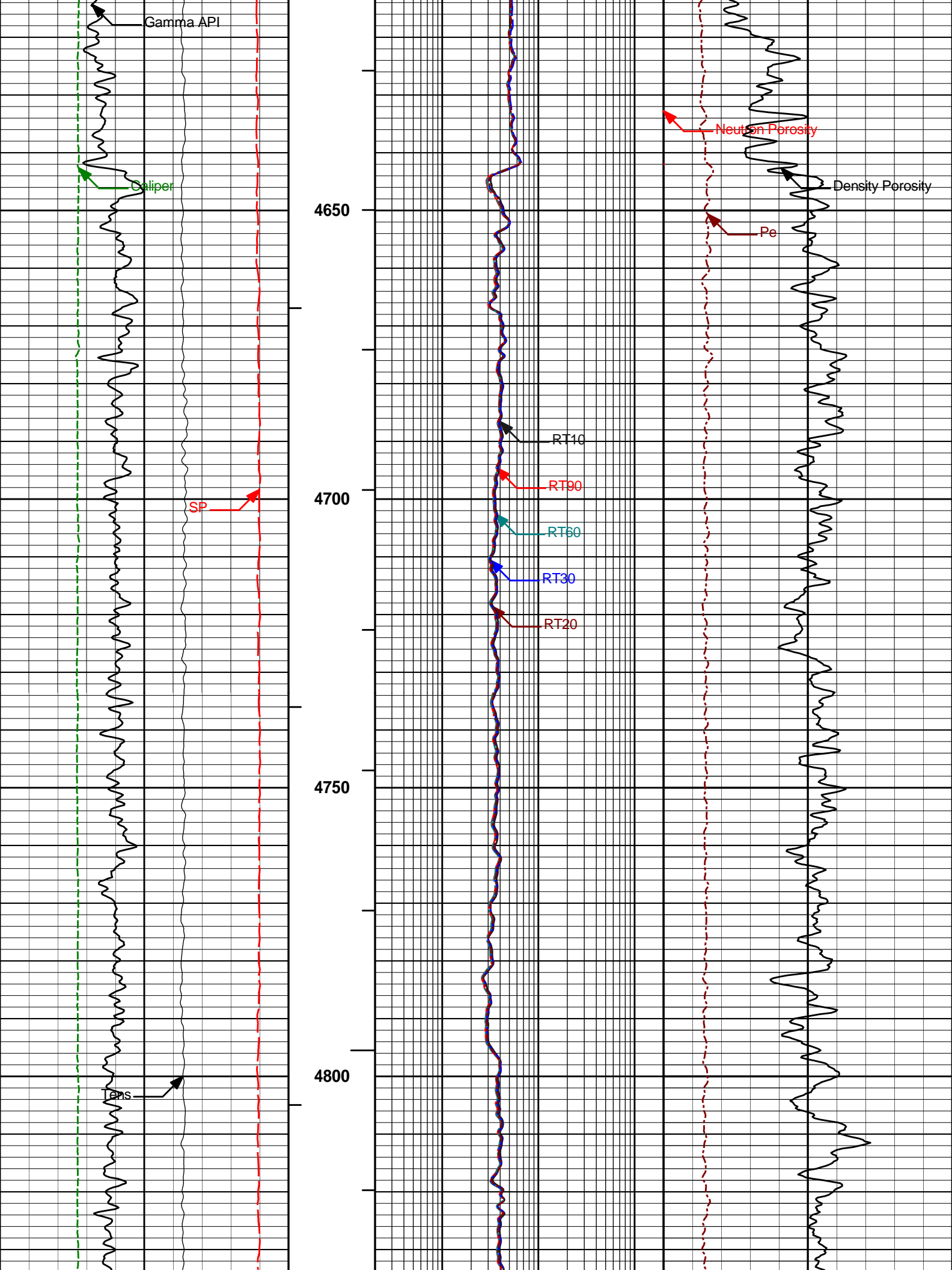


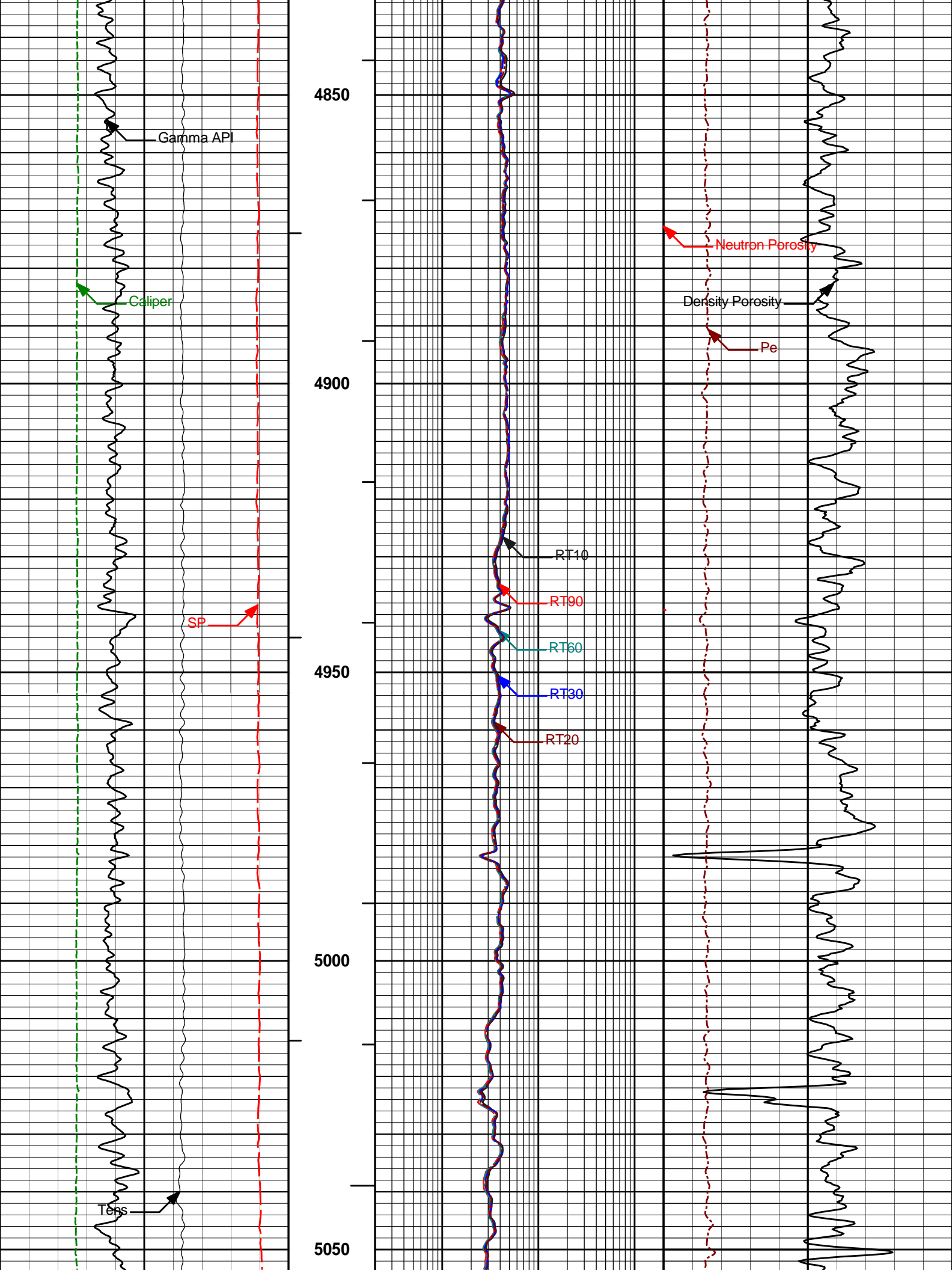


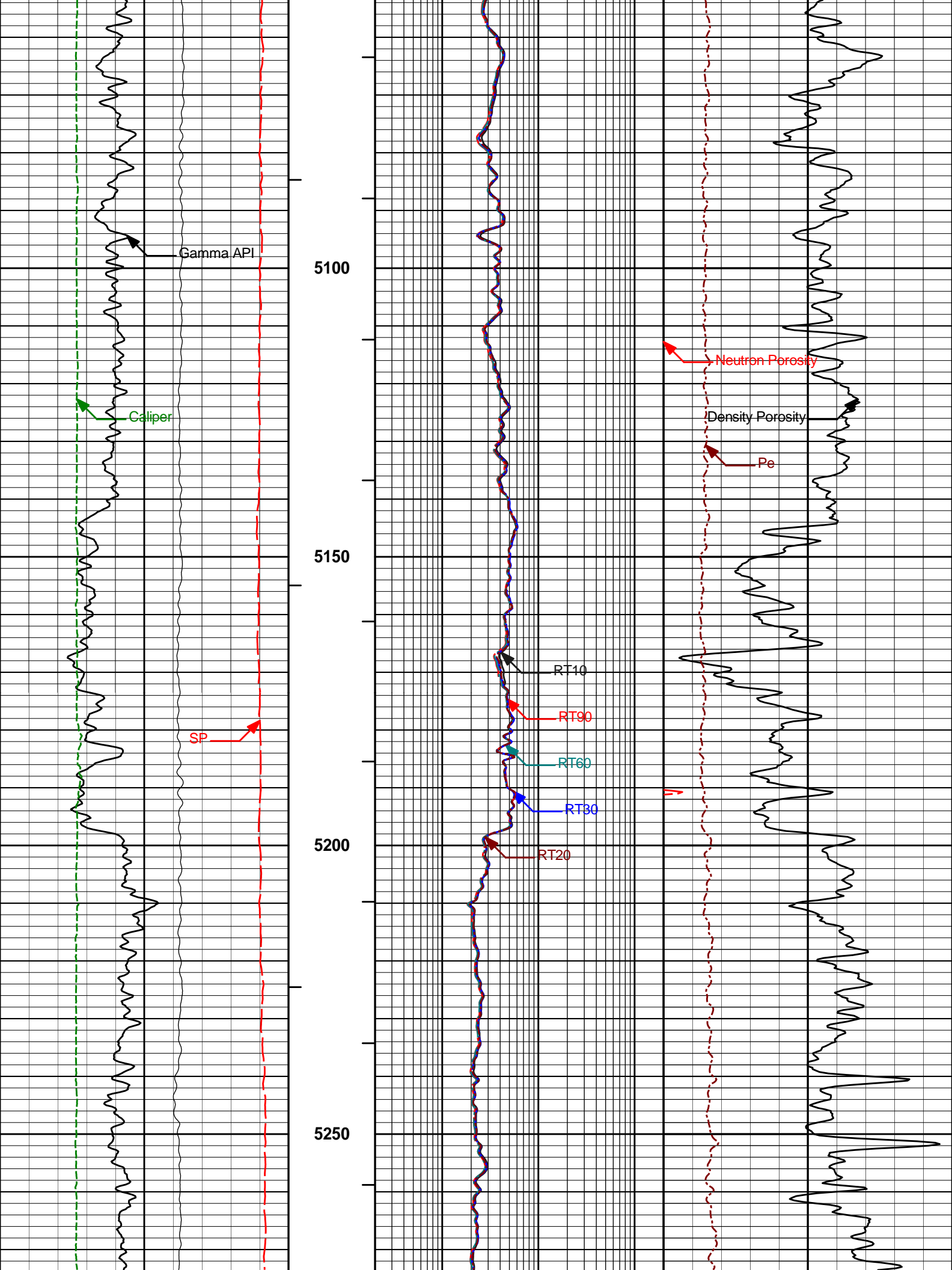


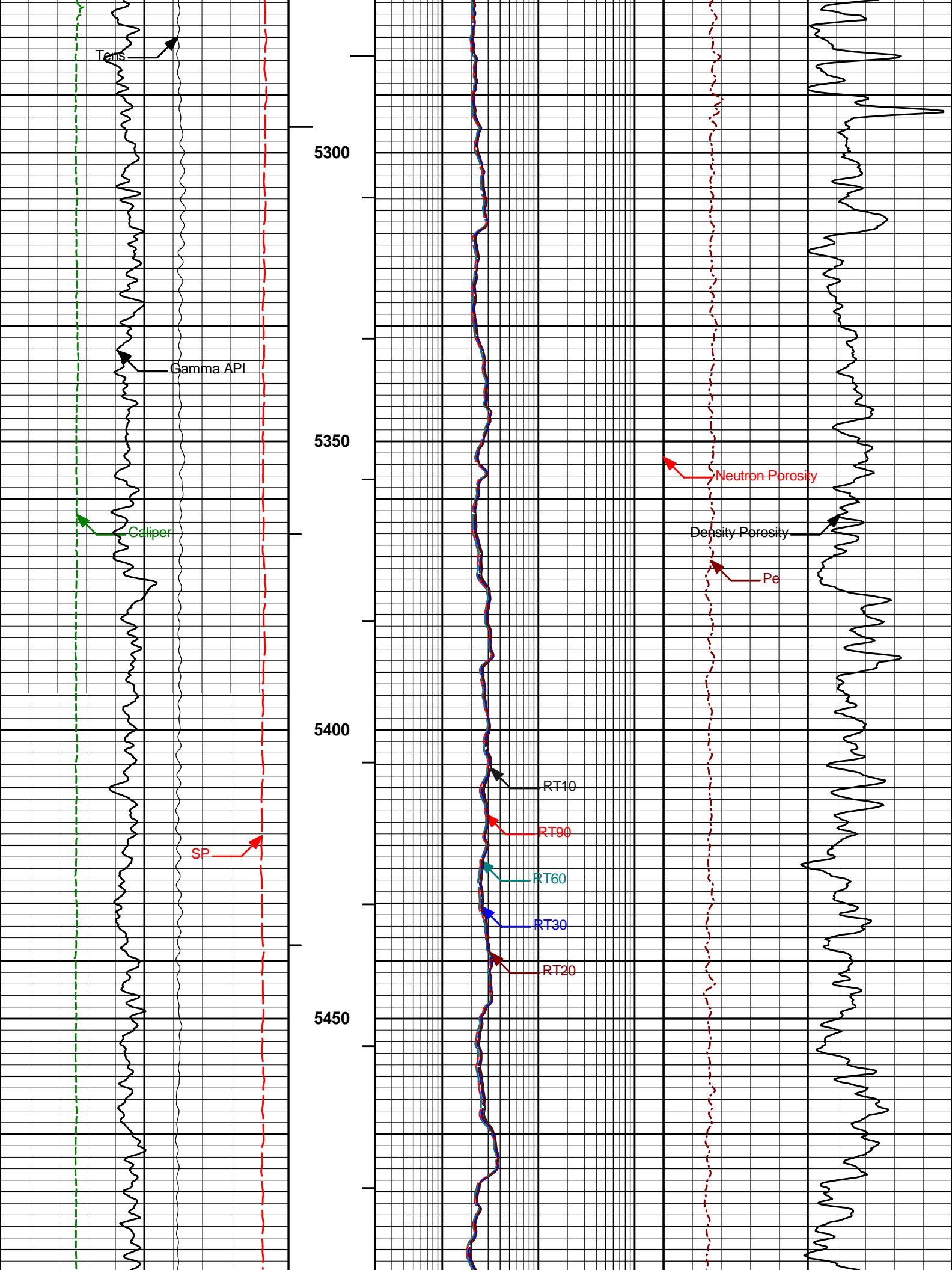


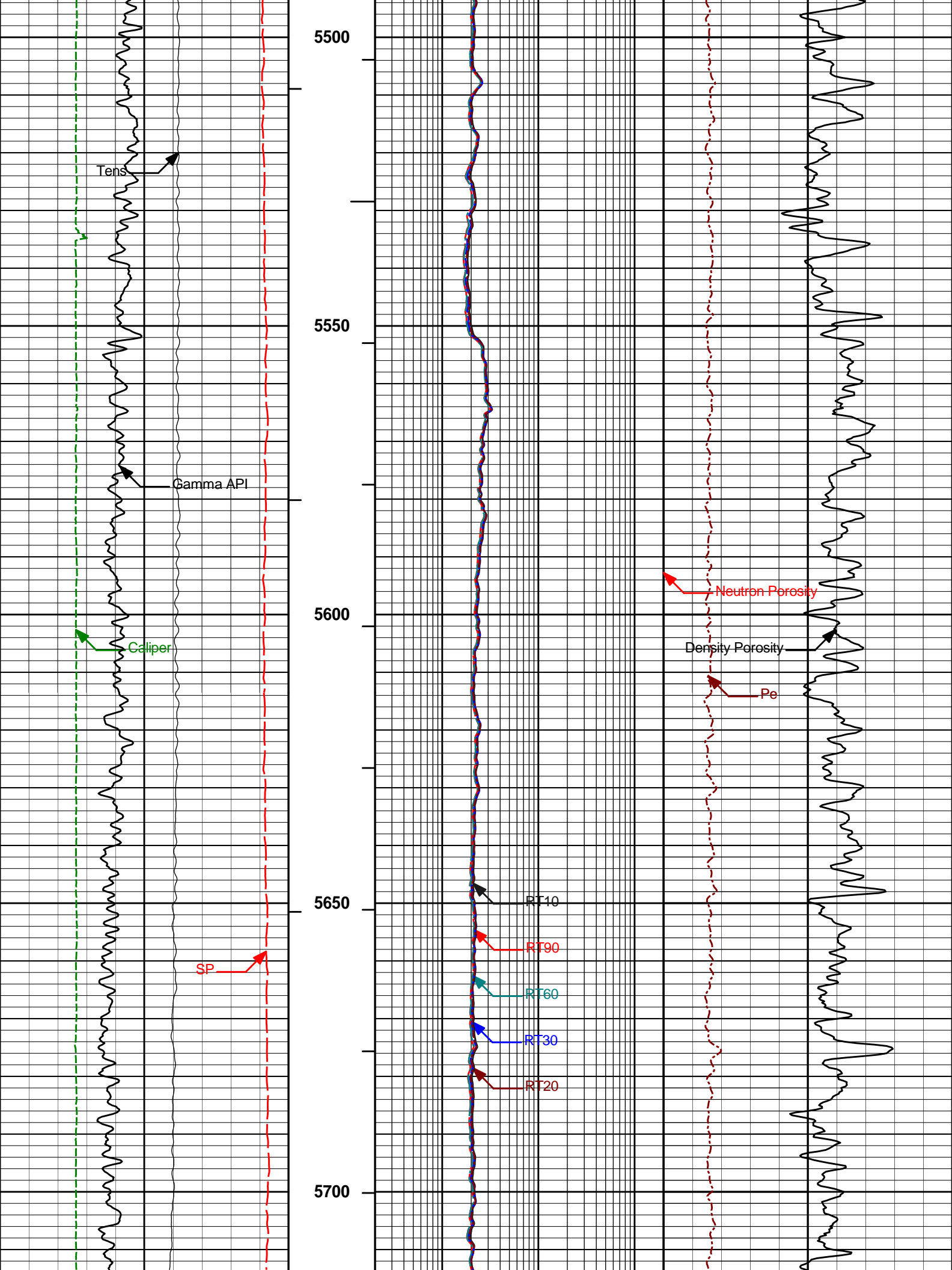


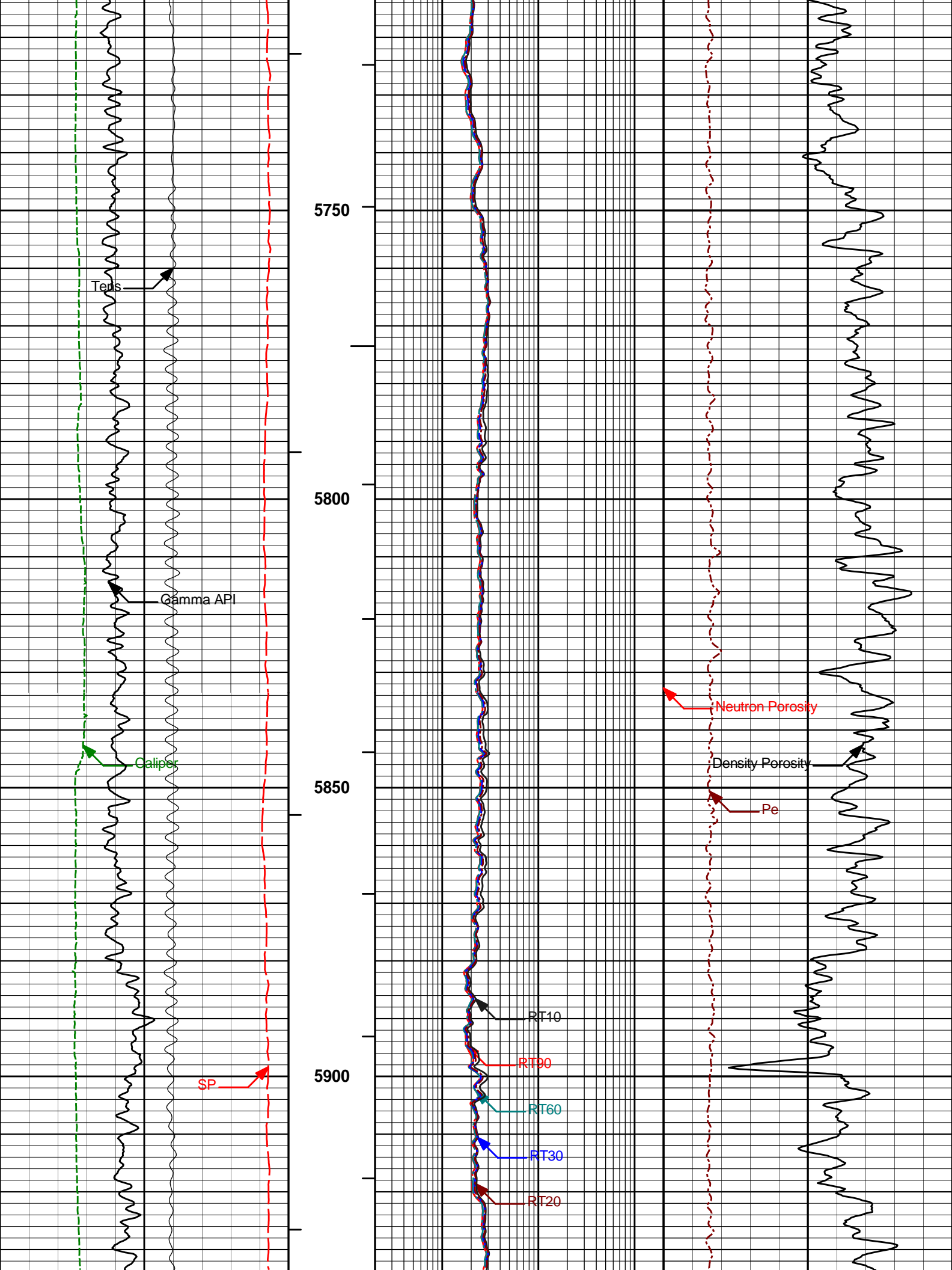


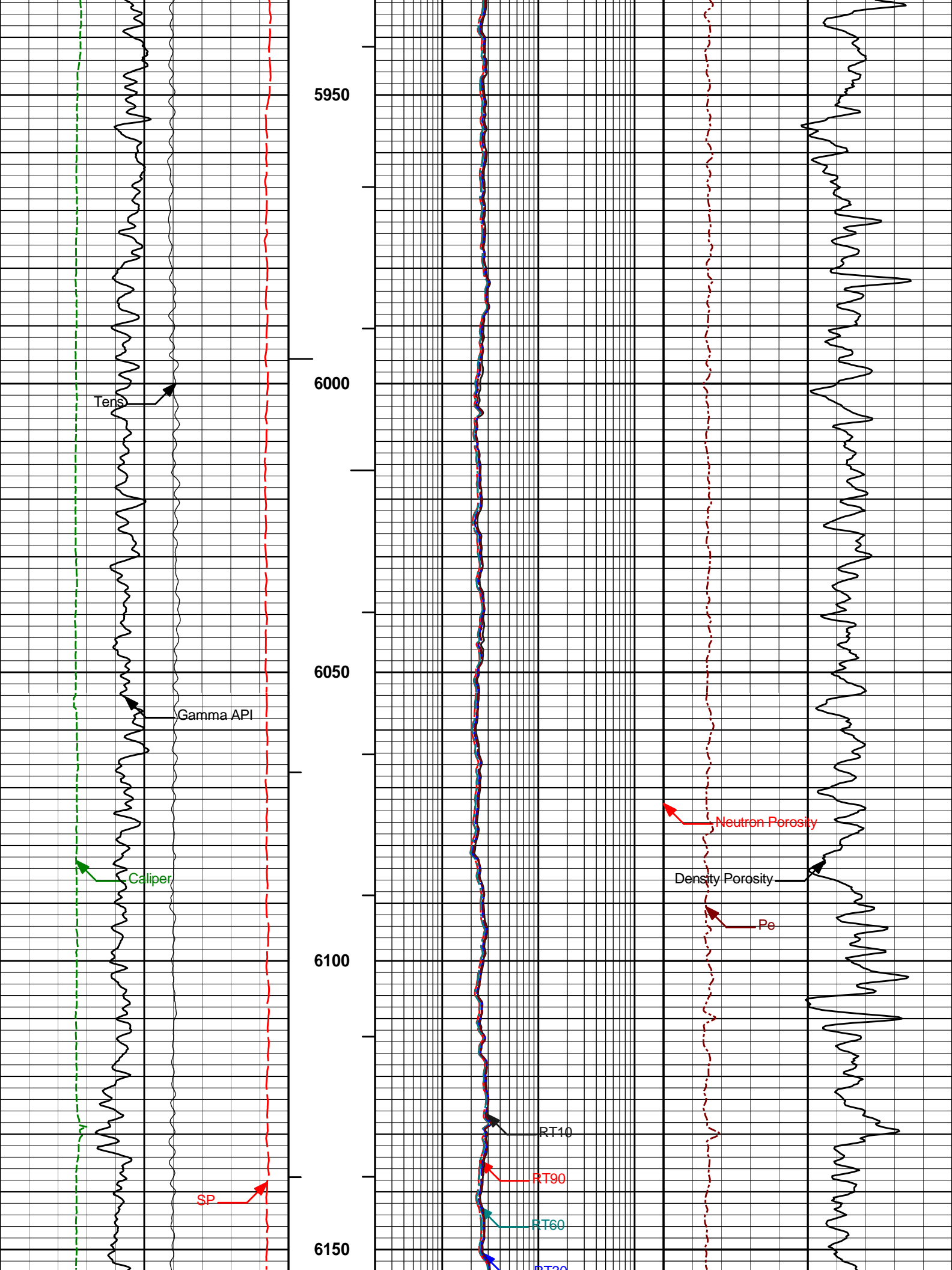




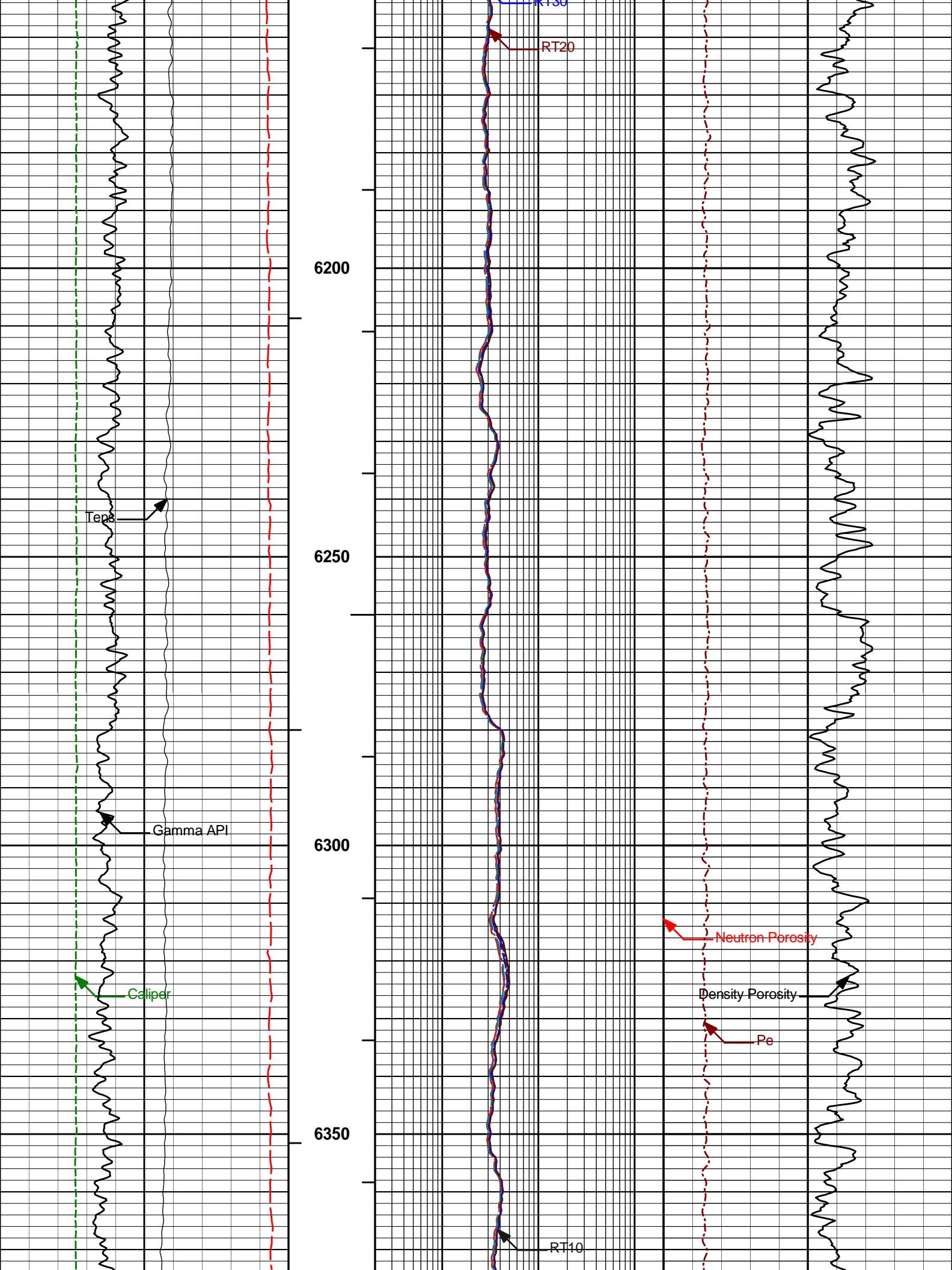


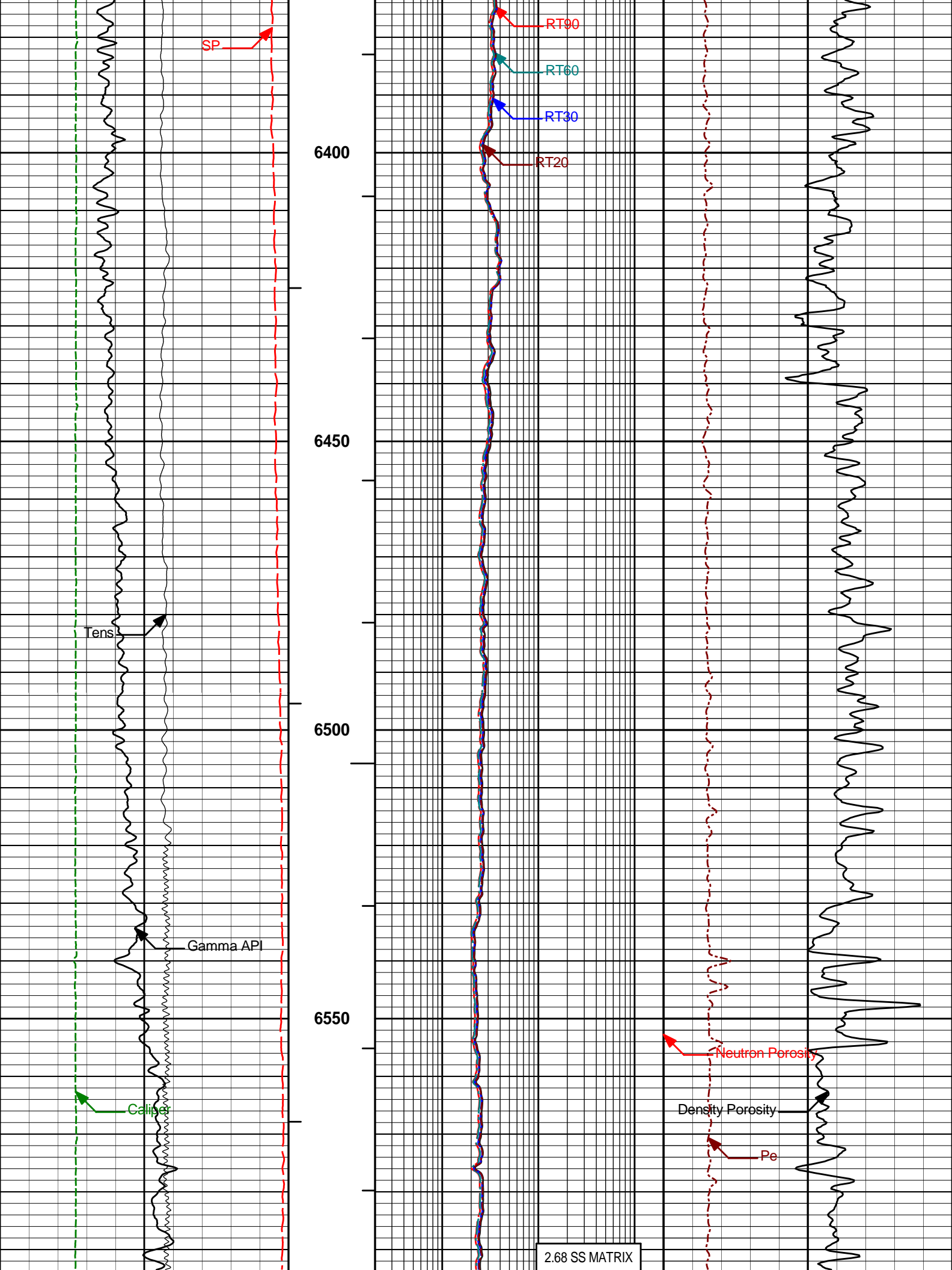


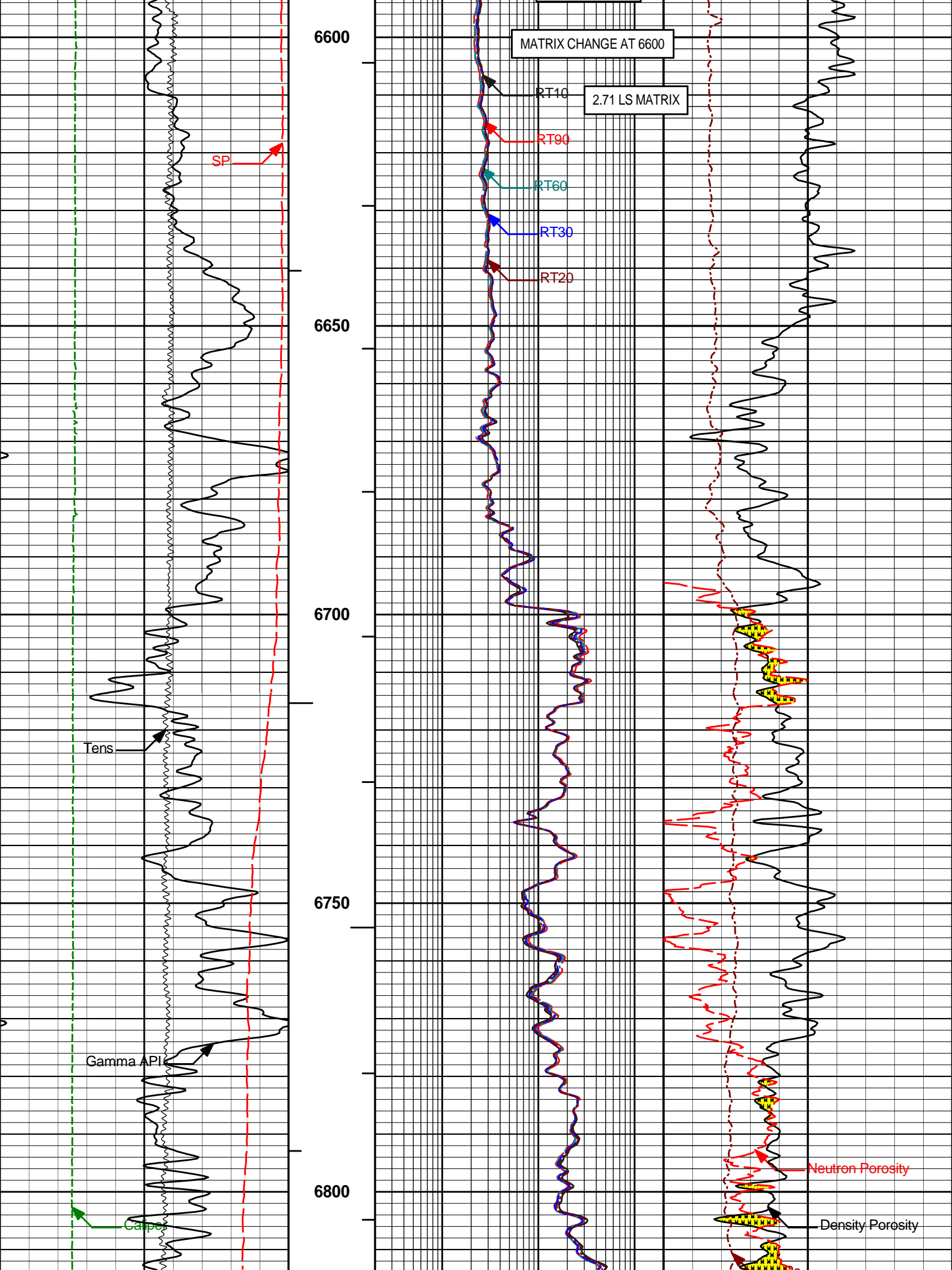


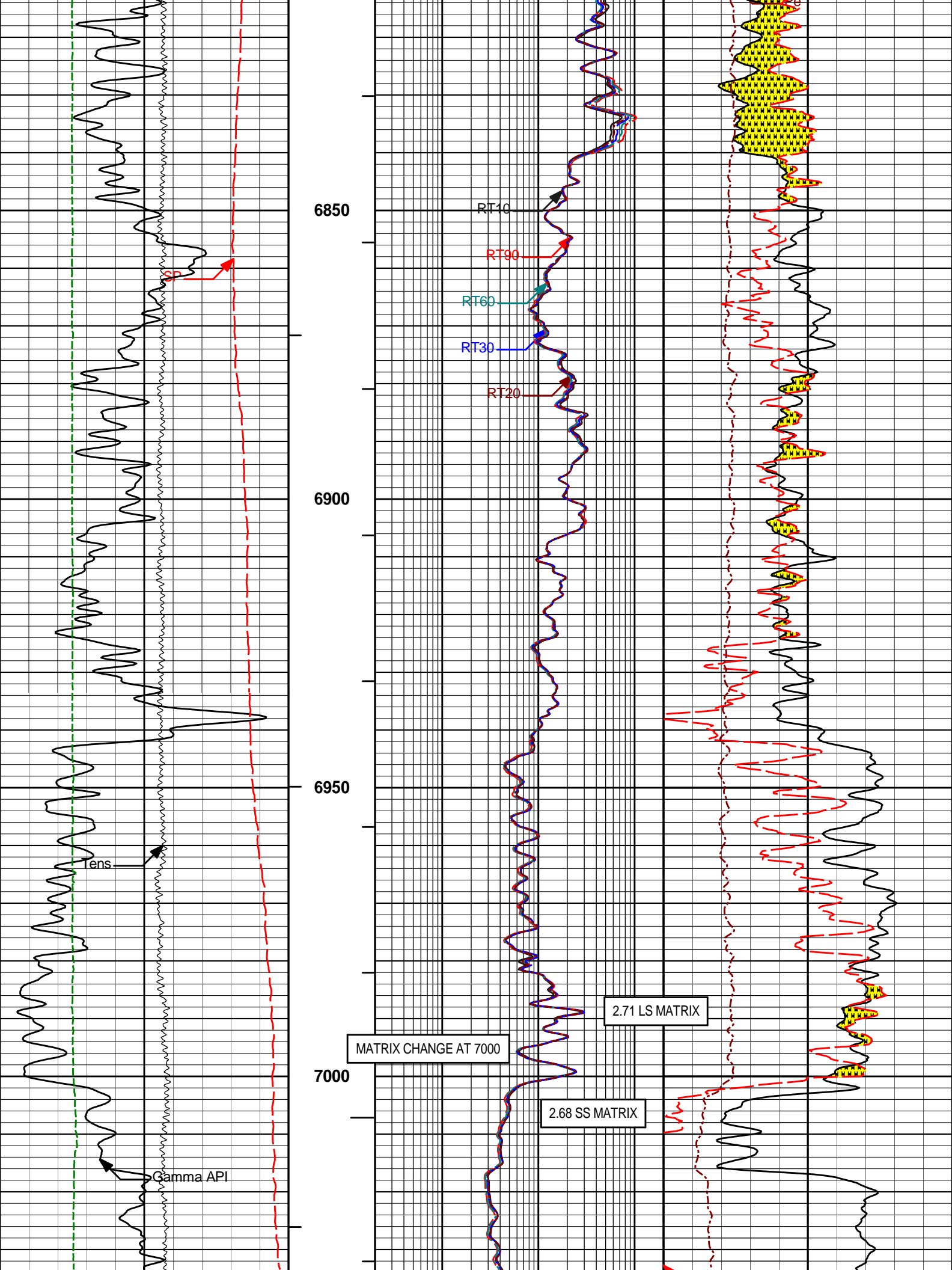


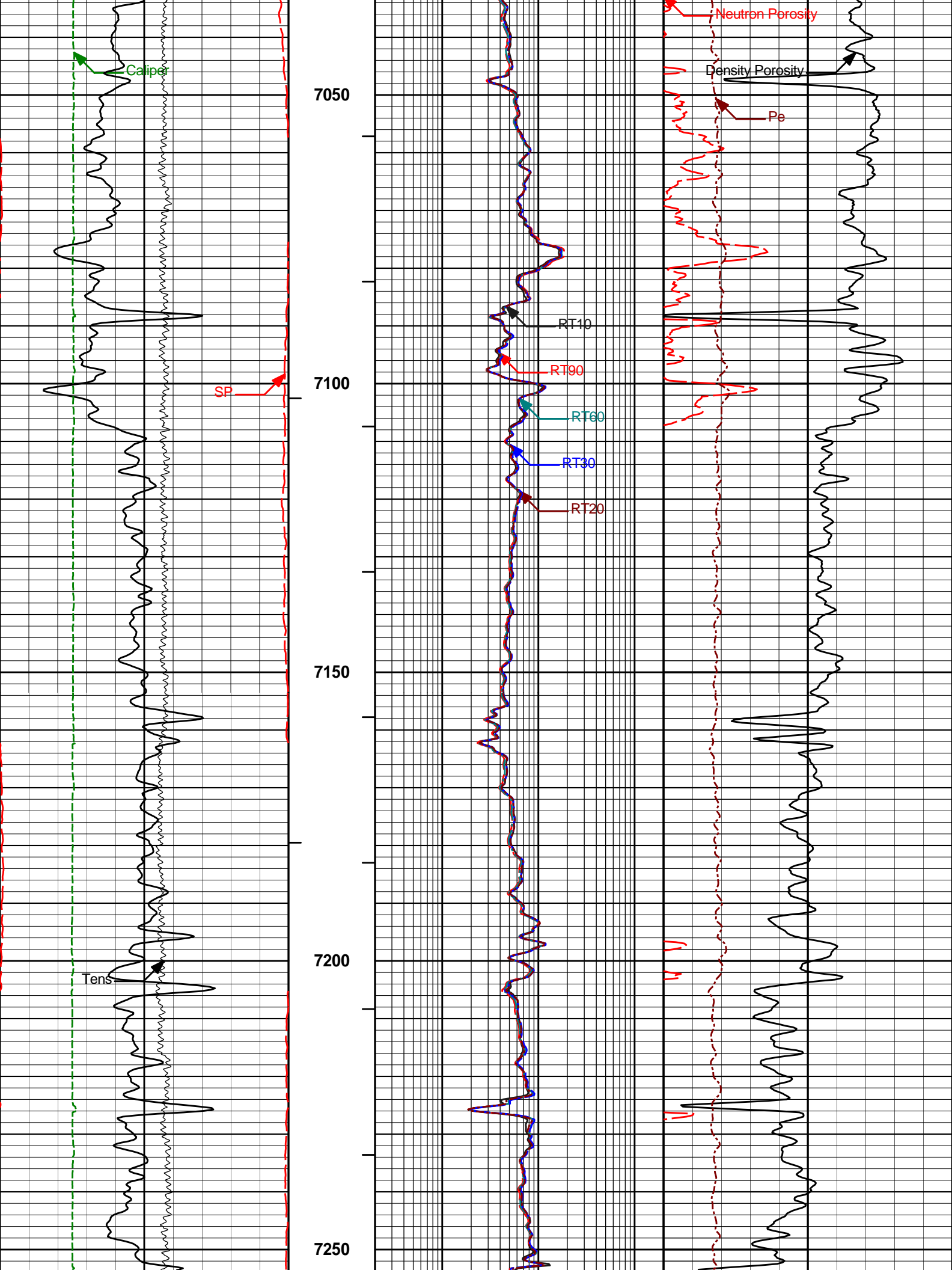


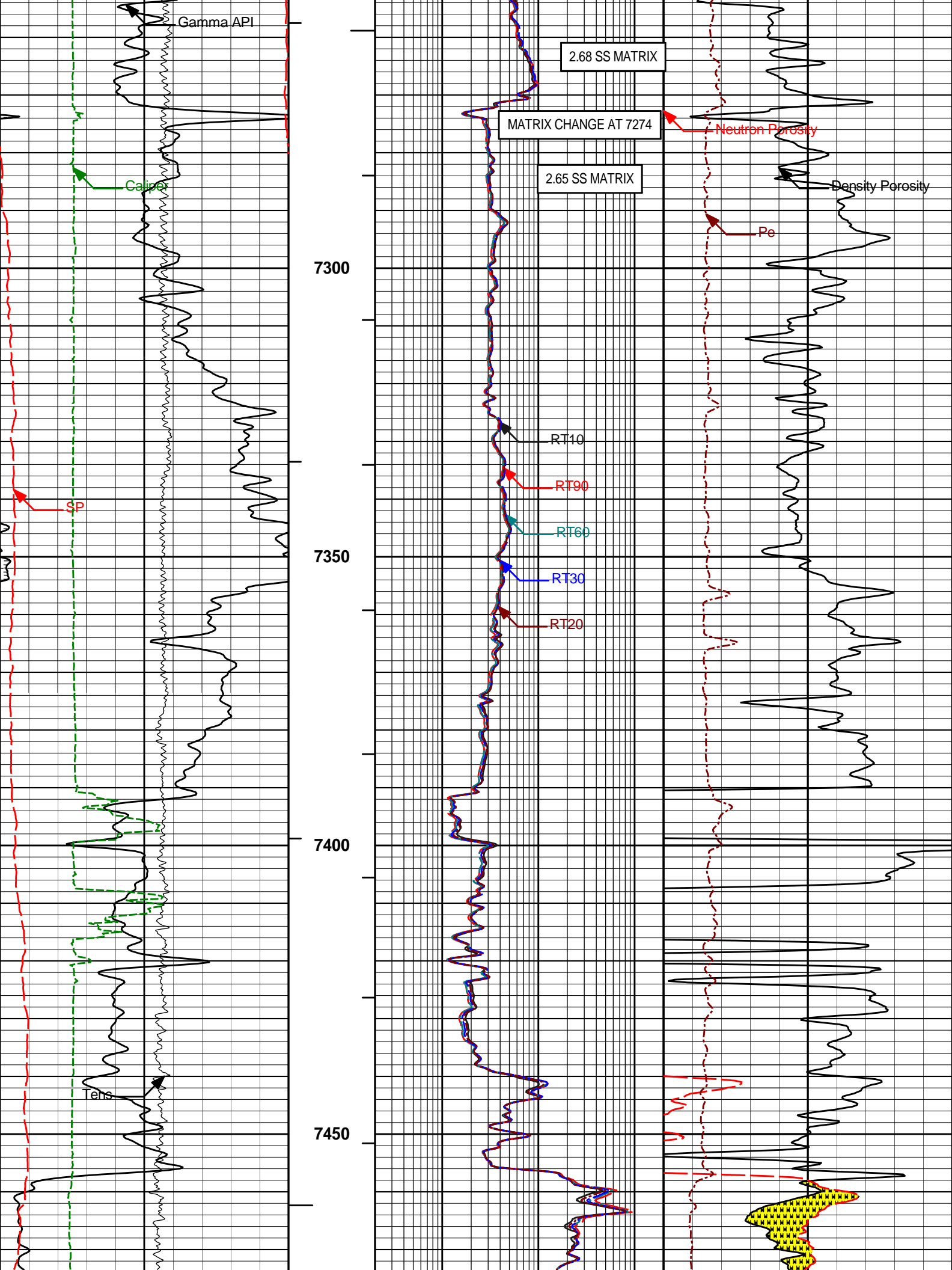


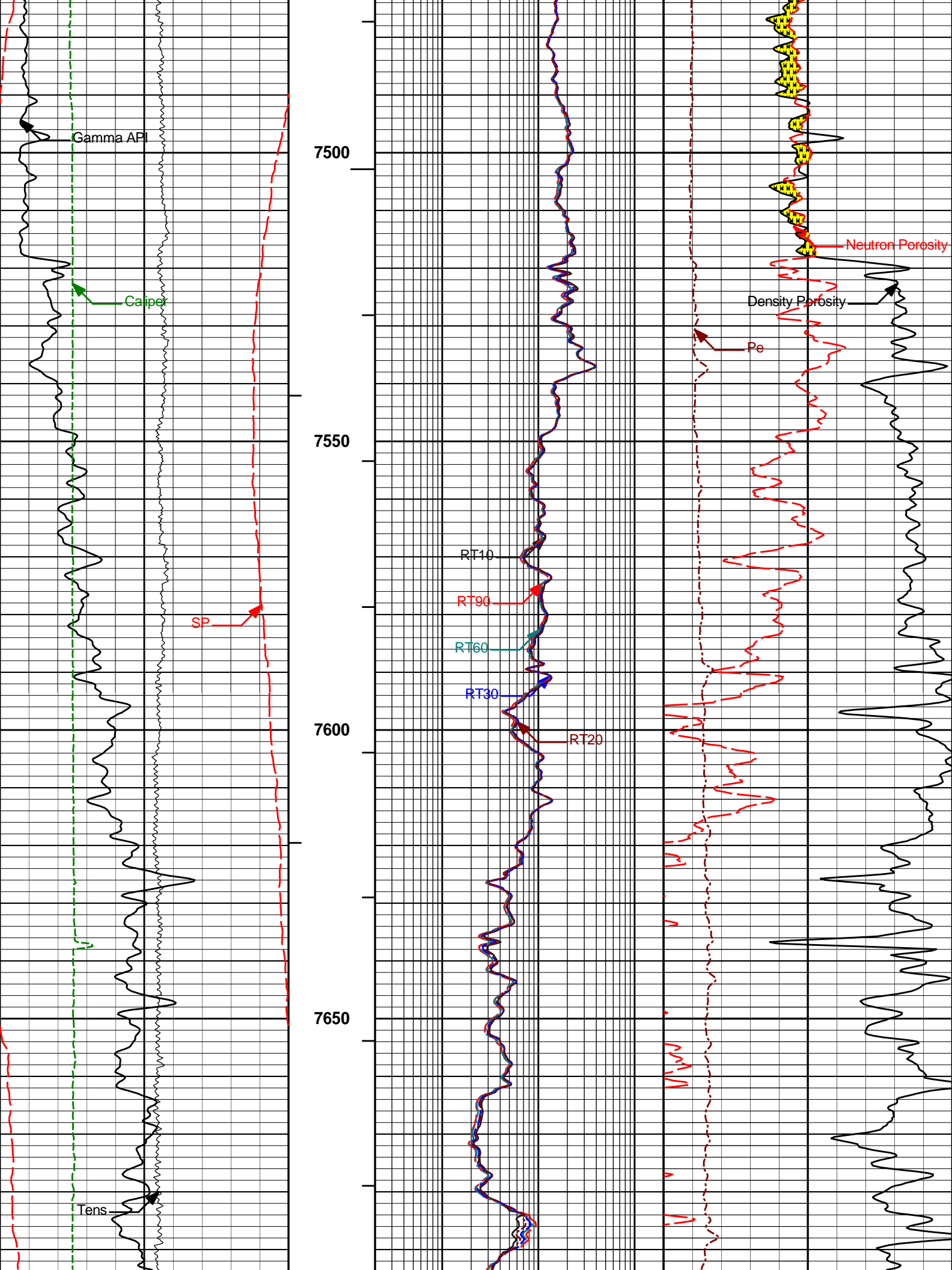


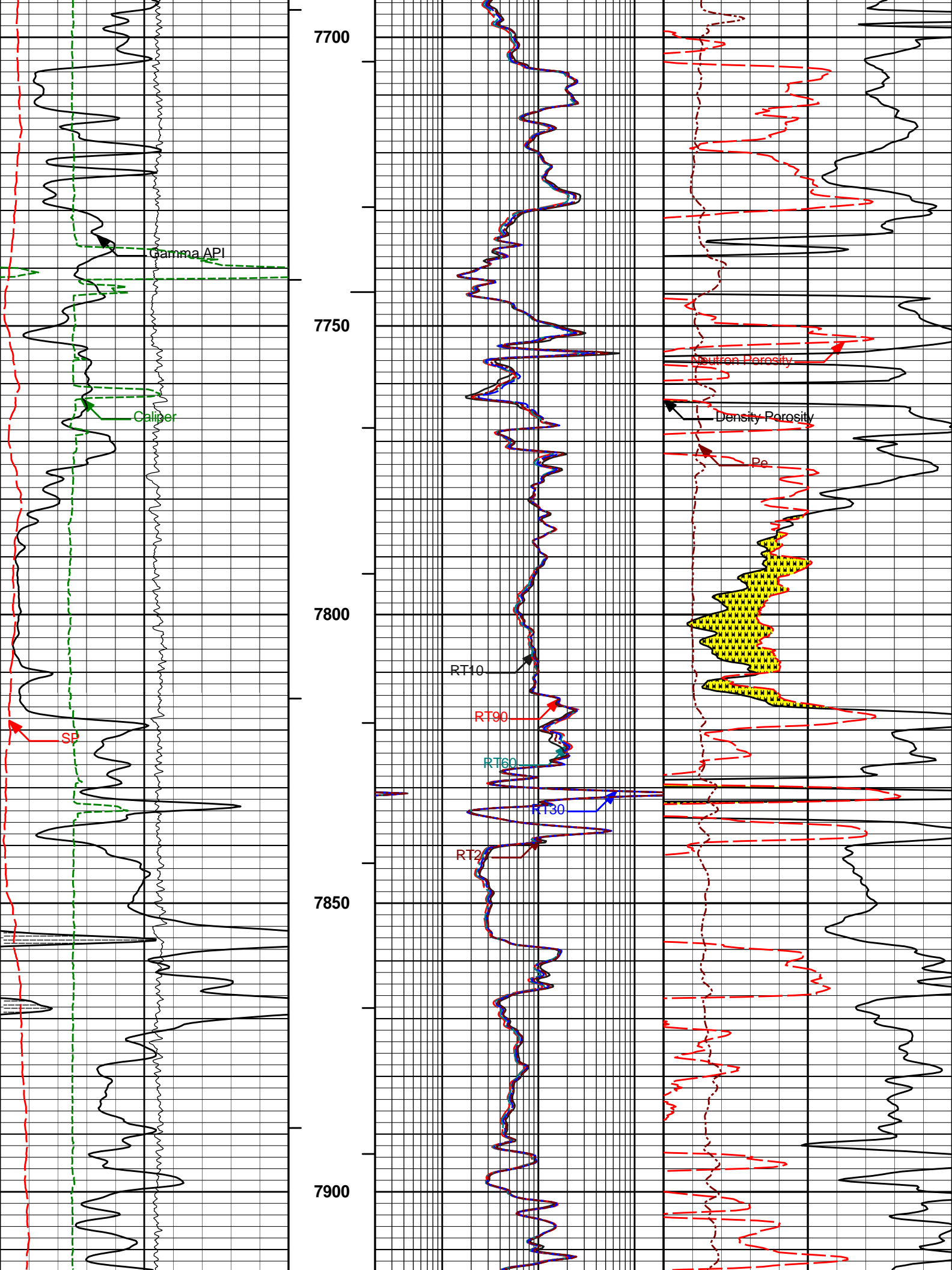




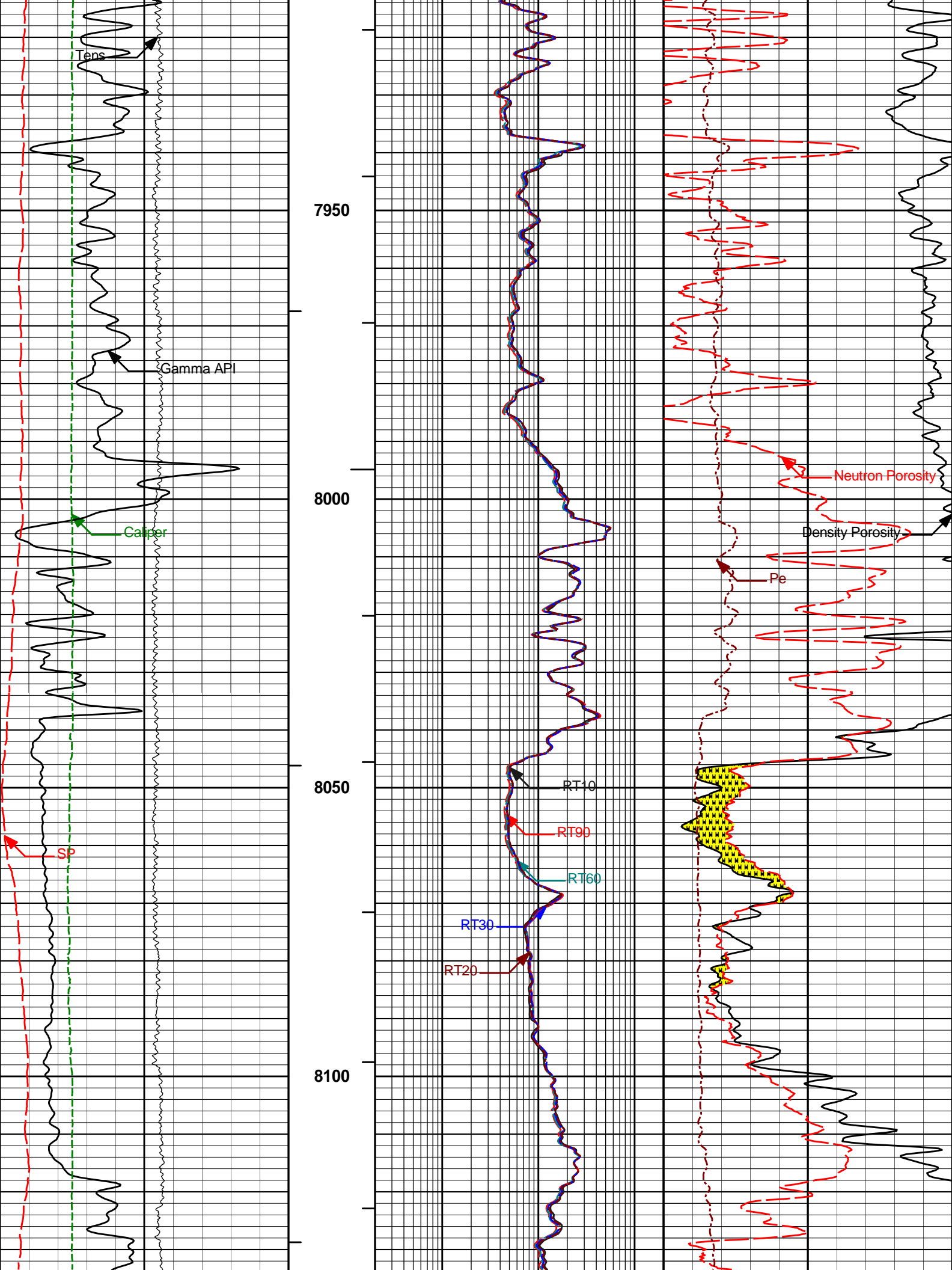


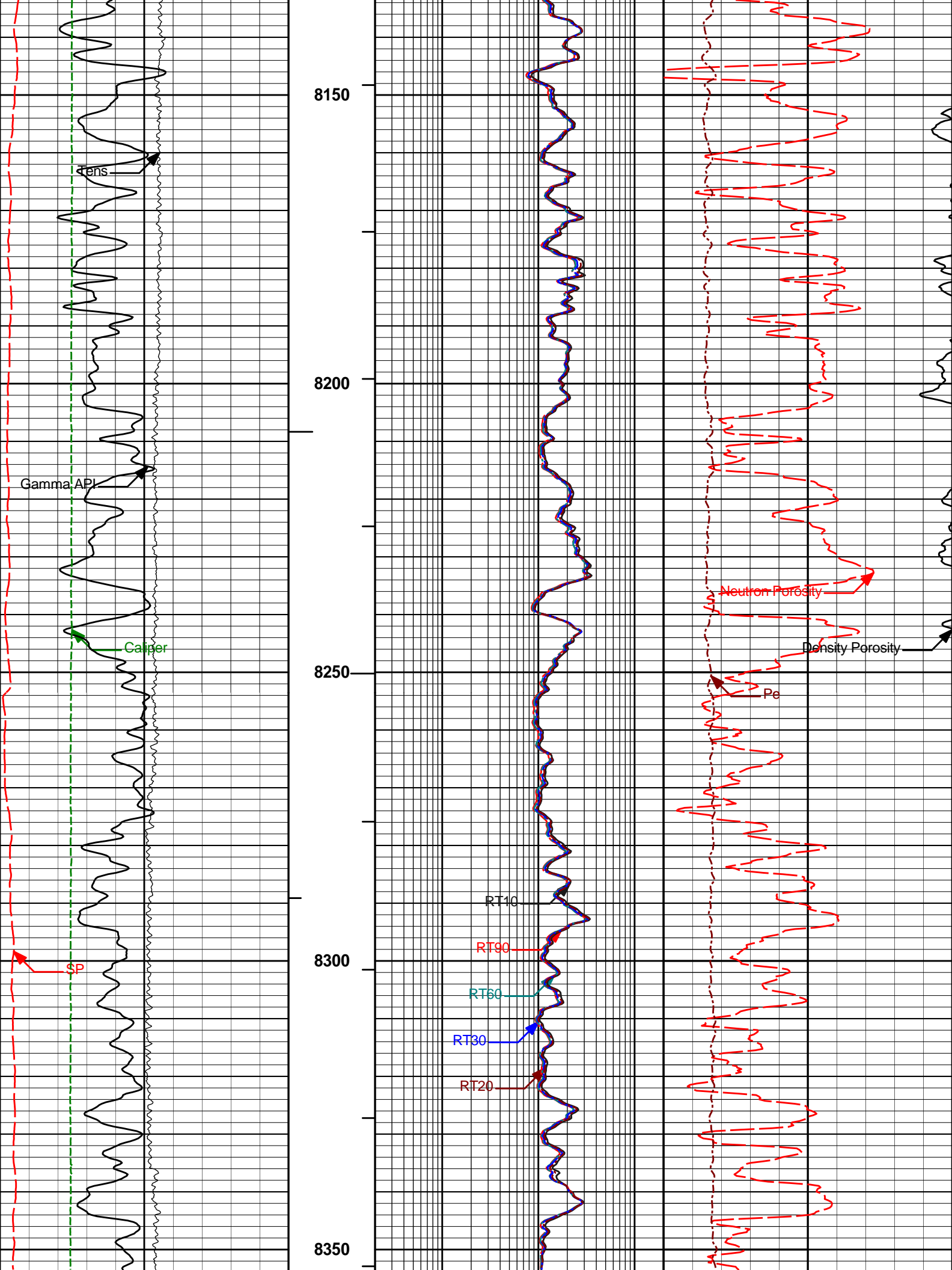


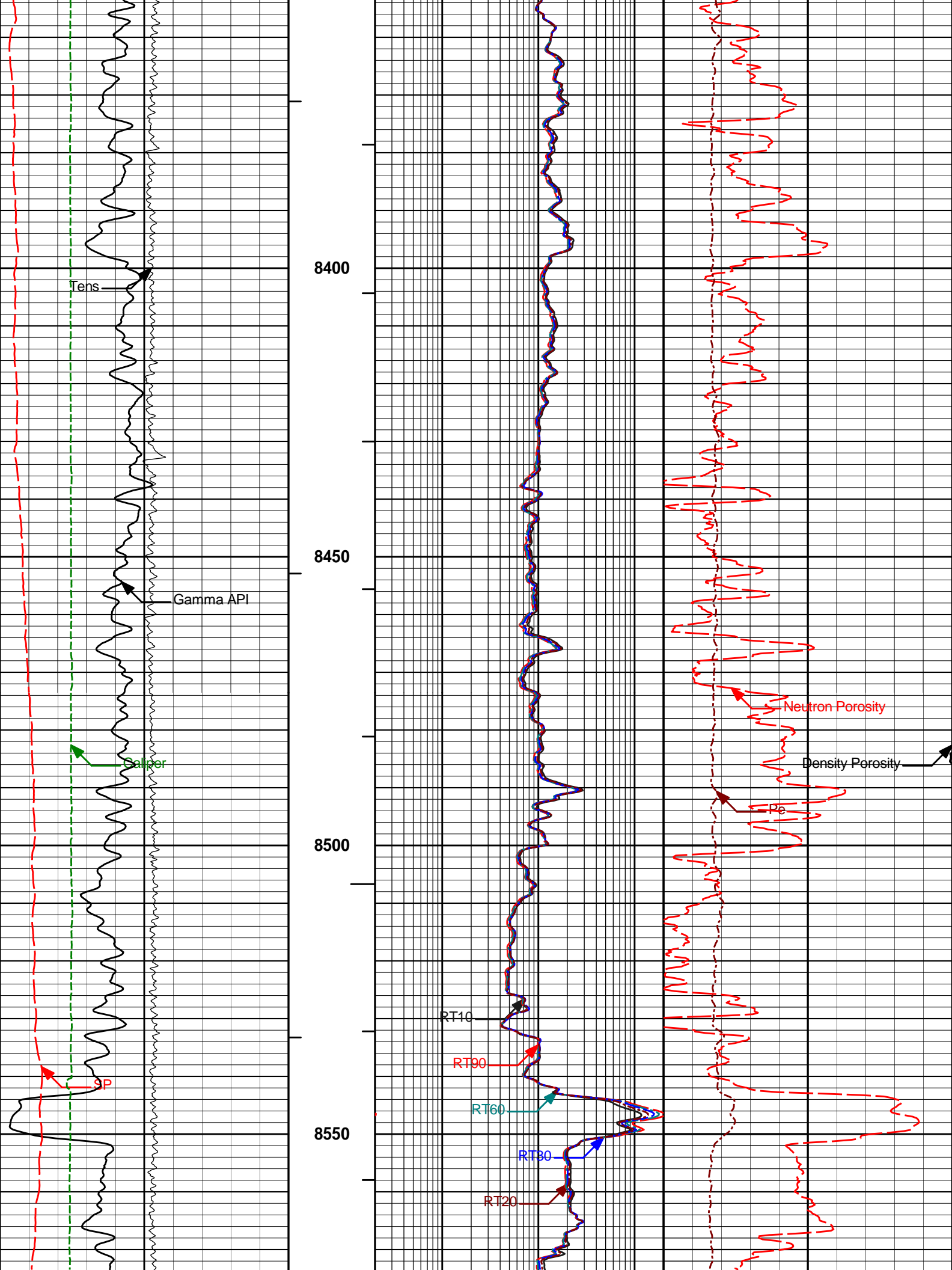


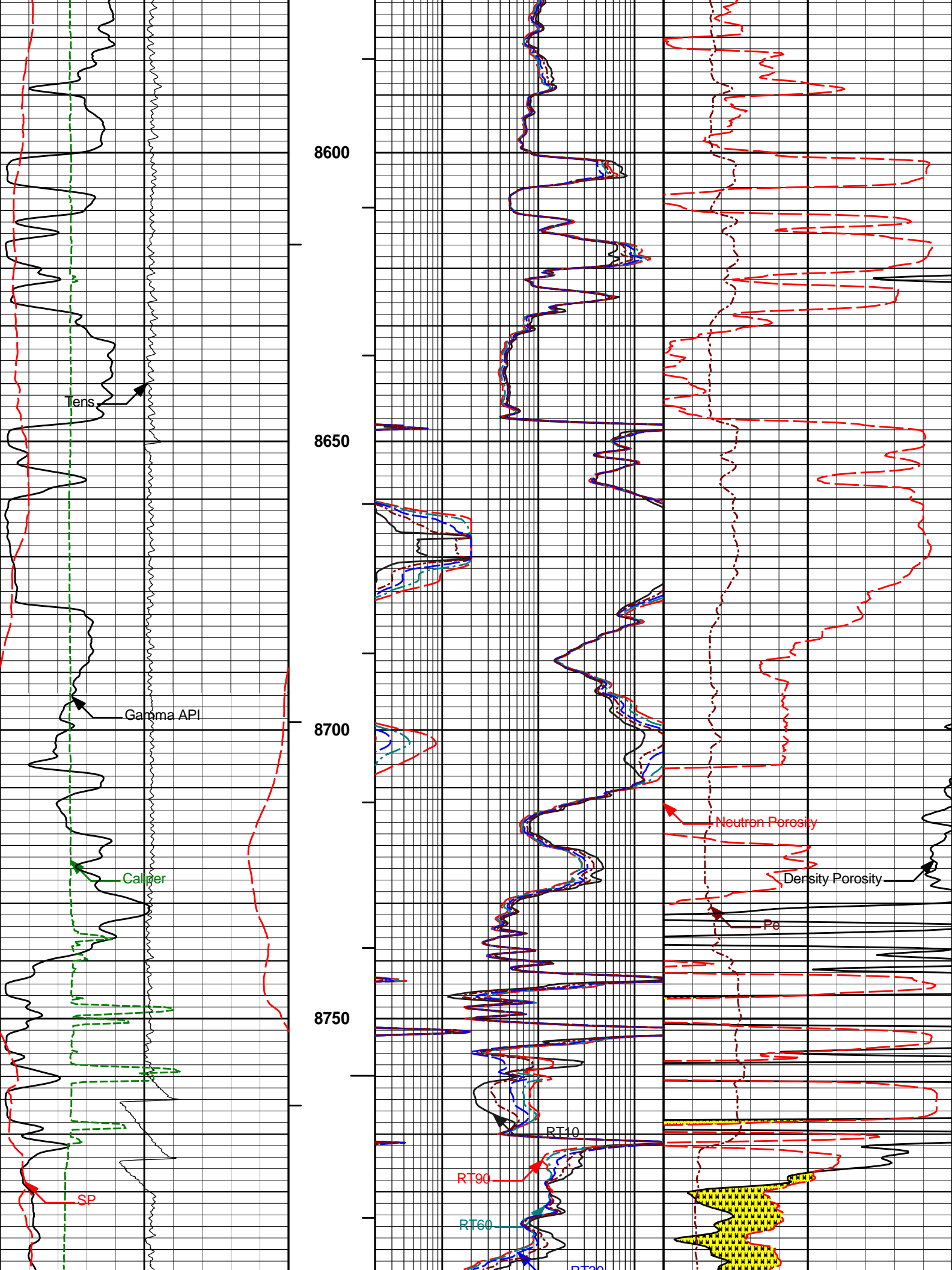


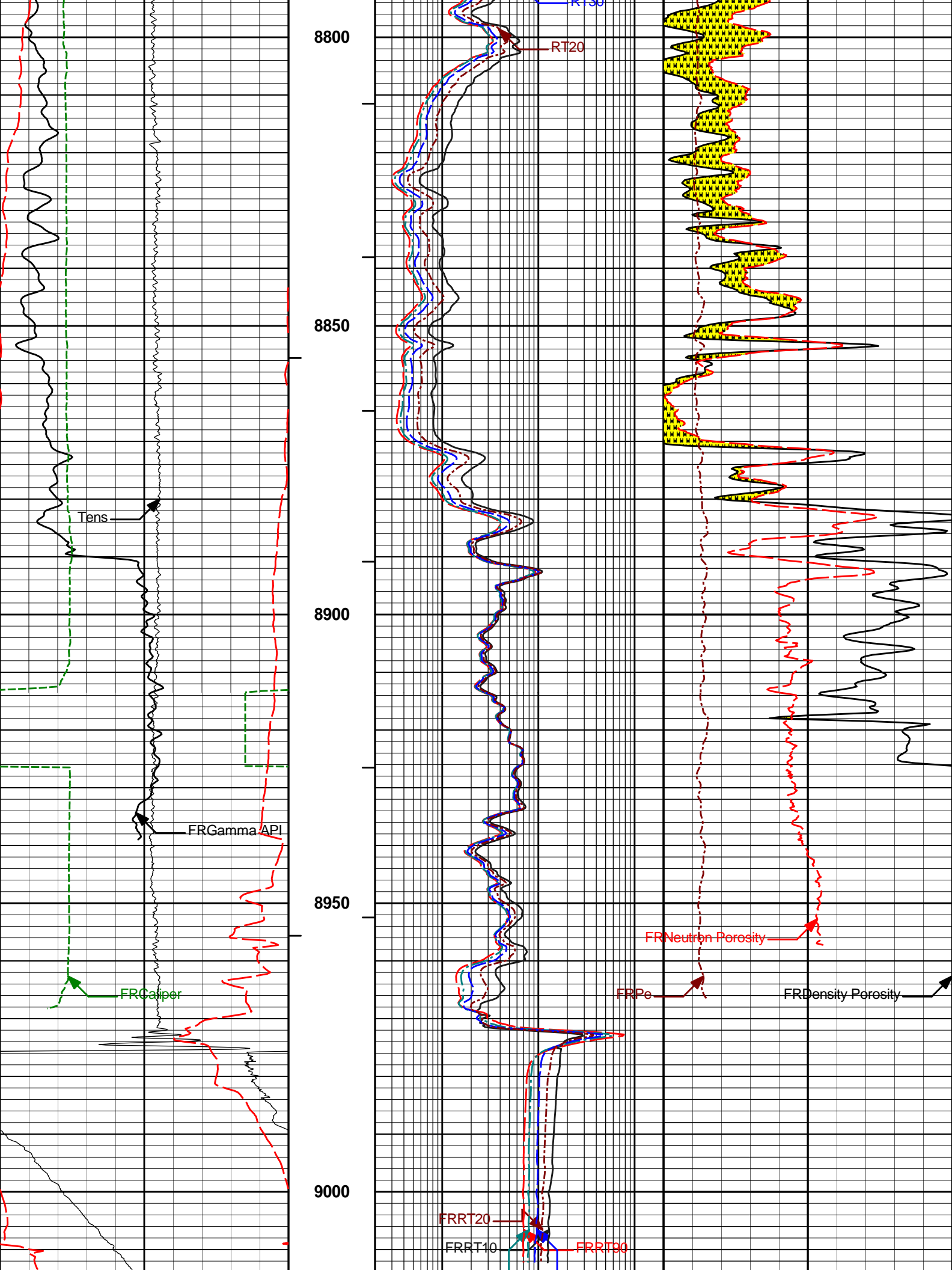


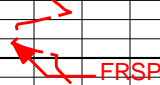










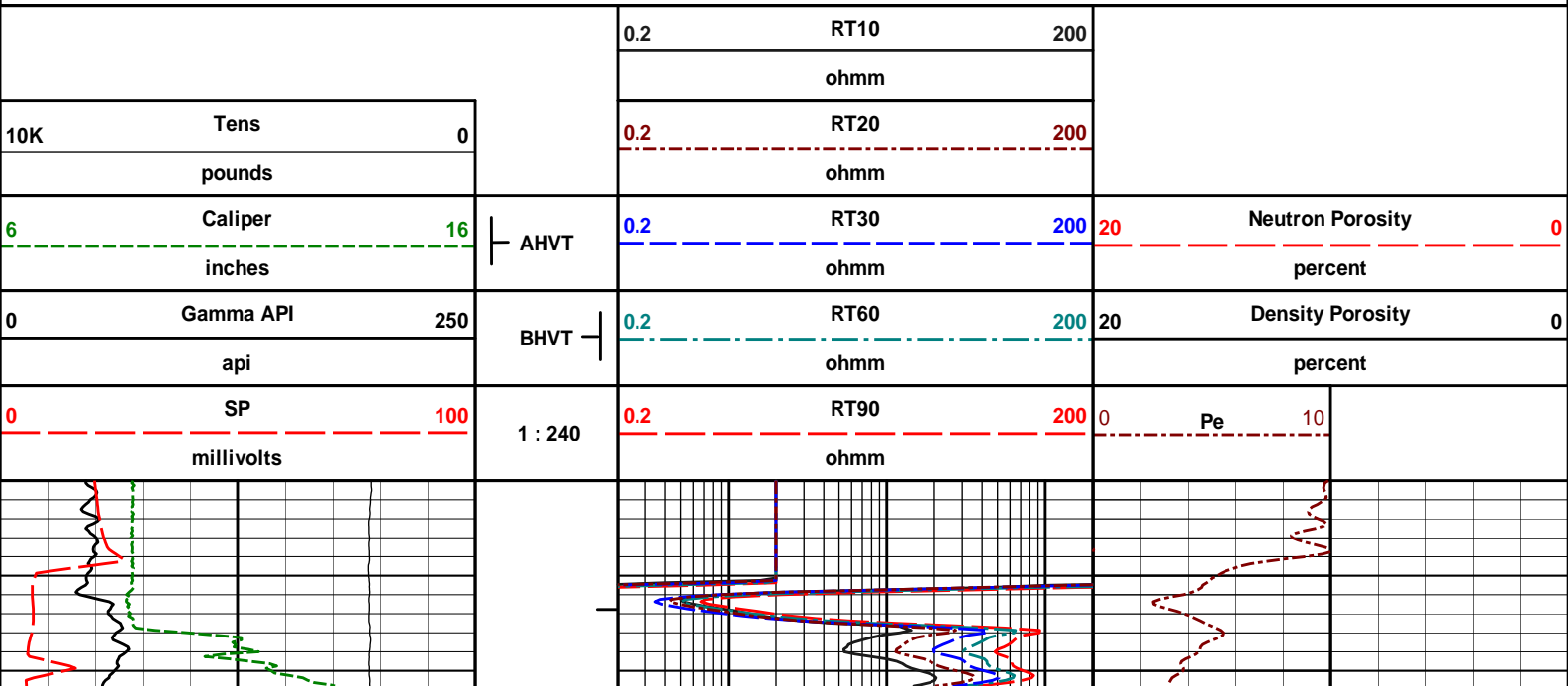
									
0	SP	100	1 : 240	0.2	RT90	200	0	Pe	10
	millivolts				ohmm				
0	Gamma API	250	BHVT	0.2	RT60	200	20	Density Porosity	0
	api				ohmm			percent	
6	Caliper	16	AHVT	0.2	RT30	200	20	Neutron Porosity	0
	inches				ohmm			percent	
10K	Tens	0		0.2	RT20	200			
	pounds				ohmm				
				0.2	RT10	200			
					ohmm				

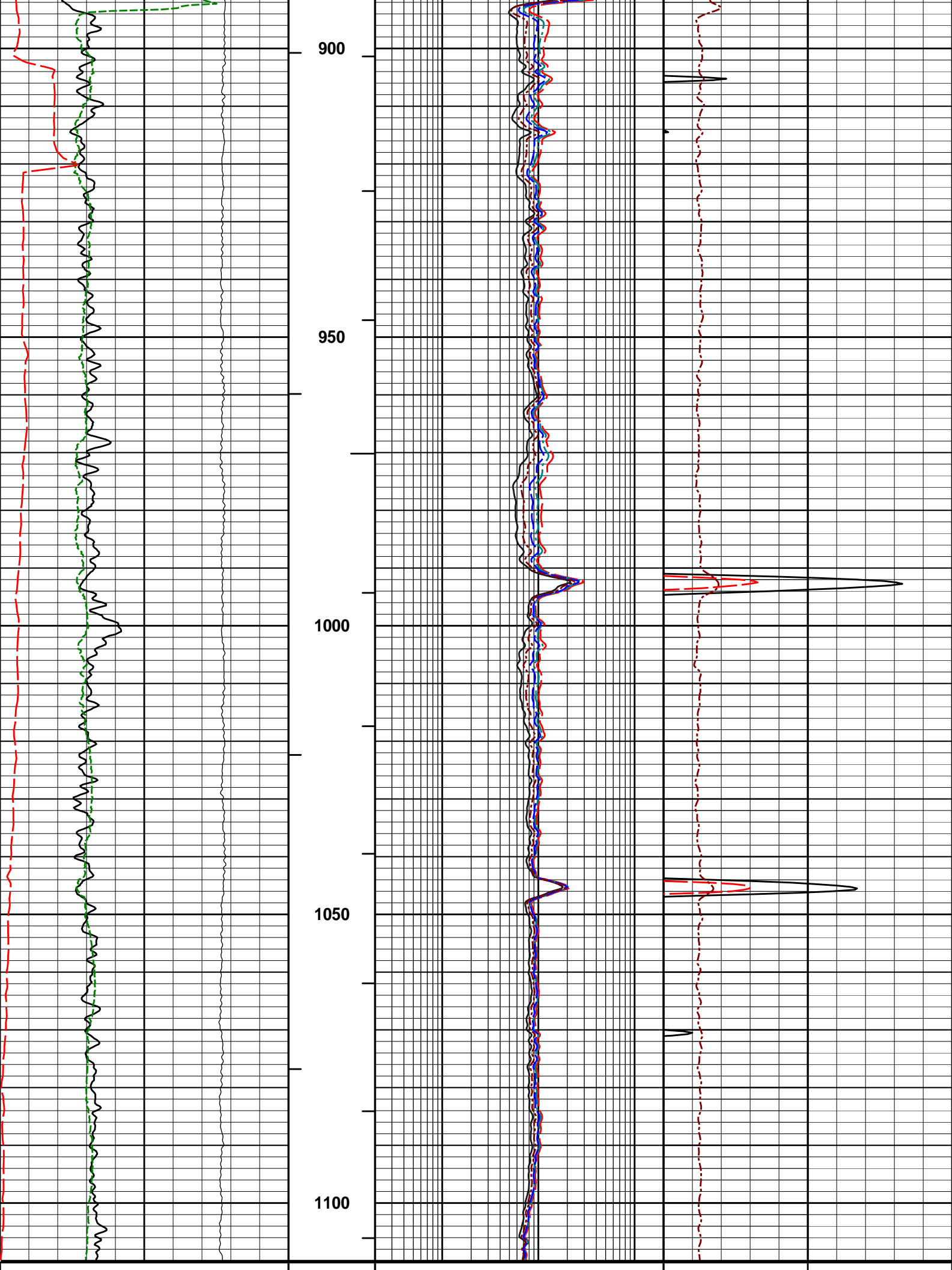
**HALLIBURTON** Plot Time: 14-Dec-12 14:43:07  
Plot Range: 870 ft to 9025.67 ft  
Data: JEANIE\_AB10-01R\Well Based\MAIN\*  
Plot File: \COMP\MAIN

MAIN PASS 5" = 100'

**HALLIBURTON** Plot Time: 14-Dec-12 14:43:07  
Plot Range: 870 ft to 1110 ft  
Data: JEANIE\_AB10-01R\Well Based\REPEAT\*  
Plot File: \COMP\REPEAT

REPEAT PASS 5" = 100'





0	SP	100	1 : 240	0.2	RT90	200	0	Pe	10	
	millivolts				ohmm					
0	Gamma API	250	BHVT	0.2	RT60	200	20	Density Porosity		0
	api				ohmm			percent		
6	Caliper	16	AHVT	0.2	RT30	200	20	Neutron Porosity		0
	inches				ohmm			percent		
10K	Tens	0		0.2	RT20	200				
	pounds				ohmm					
				0.2	RT10	200				
					ohmm					

HALLIBURTON		Plot Time: 14-Dec-12 14:43:09 Plot Range: 870 ft to 1110 ft Data: JEANIE_AB10-01R\Well Based\REPEAT\ Plot File: \COMP\REPEAT								
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REPEAT PASS 5" = 100'										
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HALLIBURTON										
CALIBRATION REPORT										

NATURAL GAMMA RAY TOOL SHOP CALIBRATION										
Tool Name:		GTET - 11277436				Reference Calibration Date:		30-Nov-12 11:47:27		
Engineer:		R. TWEETEN				Calibration Date:		14-Dec-12 01:12:15		
Software Version:		WL INSITE R3.8.0 (Build 2)				Calibration Version:		1		

Calibrator Source S/N: TB-289										
Calibrator API Reference:243.00 api										
Equivalent Calibrator API Reference:247.3 api										
		Measurement	Measured		Calibrated		Units			
		Background	70.7		73.7		api			
		Background + Calibrator	307.9		321.0		api			
		Calibrator	237.2		247.3		api			

NATURAL GAMMA RAY TOOL FIELD CALIBRATION										
Tool Name:		GTET - 11277436				Reference Calibration Date:		14-Dec-12 01:12:15		
Engineer:		R. TWEETEN				Calibration Date:		14-Dec-12 01:15:18		
Software Version:		WL INSITE R3.8.0 (Build 2)				Calibration Version:		1		

Calibrator Source S/N: TB-289										
Calibrator API Reference:243.00 api										
Equivalent Calibrator API Reference:247.3 api										
		Field Verification	Shop		Field		Units			
		Background	73.7		73.6		api			
		Background + Calibrator	321.0		322.8		api			
		Calibrator	247.3		249.1		api			

		Shop	Field		Difference		Tolerance			
		247.3	249.1		-1.8		+/- 9.00			



DUAL SPACED NEUTRON SHOP CALIBRATION				
Tool Name:	DSNT - 11812167		Reference Calibration Date:	19-Nov-12 09:34:26
Engineer:	J. SCHMIDT		Calibration Date:	19-Nov-12 09:50:39
Software Version:	WL INSITE R3.8.0 (Build 2)		Calibration Version:	1
Logging Source S/N: DSN434				
Tank Serial Number: 11068236				
Reference value assigned to Tank: 53.720				
Snow Block S/N: BRIGHTON				
Calibration Tank Water Temperature: 60 degF				
Min. Tool Housing Outside Diameter: 3.625 in				
CALIBRATION CONSTANTS				
Measurement	Prev. Value	New Value	Control Limit On New Value	
Gain:	0.966	0.967	0.900 - 1.100	
WATER TANK SUMMARY (Horizontal Water Tank)				
Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (decp):	0.2218	0.2223	0.0006	+/- 0.0020
Calibrated Ratio:	10.09	10.11	0.019	+/- 0.050
VERIFIER				
Measurement	Value	Control Limit		
Snow-Block Porosity (decp):	0.0754	0.02000 - 0.09000		
PASS/FAIL SUMMARY				
Background Check:			Passed	
Gain-Range Check:			Passed	
Snow-Block Check:			Passed	

DUAL SPACED NEUTRON FIELD CALIBRATION				
Tool Name:	DSNT - 11812167		Reference Calibration Date:	19-Nov-12 09:50:39
Engineer:	R. TWEETEN		Calibration Date:	14-Dec-12 01:25:51
Software Version:	WL INSITE R3.8.0 (Build 2)		Calibration Version:	1
Logging Source S/N: DSN434				
Snow Block S/N: BRIGHTON				
NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0754	0.0747	-0.0008	+/- 0.0150
PASS/FAIL SUMMARY				
Block Change Check:			Passed	
Snow Block Stat Check:			Passed	
Temperature Check:			Passed	

DENSITY CALIPER SHOP CALIBRATION				
Tool Name:	SDLT - 11812177		Reference Calibration Date:	19-Nov-12 11:01:33
Engineer:	J. SCHMIDT		Calibration Date:	19-Nov-12 11:08:51
Software Version:	WL INSITE R3.8.0 (Build 2)		Calibration Version:	1

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-4165.94	-3683.97	-7000.00 - -1000.00
Pad Gain	0.0003992	0.0003788	0.000200 - 0.000600
Arm Offset	-4106.19	-4439.51	-5000.00 - 3000.00
Arm Gain	0.0005533	0.0005472	0.000300 - 0.000700
Arm Power	-0.000004210	-0.000003809	-0.000010000 - 0.000010000

The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + TOOL DIAMETER

Tool Diameter: 4.50 in

CALIBRATION RINGS				
Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change	Control Limit On New Value
PAD EXTENSION:				
Small Ring (in)	1.92	2.00	0.08	+/- 0.20
Medium Ring (in)	3.76	3.75	-0.01	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.51	6.50	-0.01	+/- 0.20
Medium Ring (in)	8.27	8.25	-0.02	+/- 0.20
Large Ring (in)	14.98	15.00	0.02	+/- 0.20

PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed
Ring-Measurement Check:	Passed
PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name:	SDLT Pad - 11795867	Reference Calibration Date:	22-Oct-12 10:41:25
Engineer:	J. SCHMIDT	Calibration Date:	19-Nov-12 10:39:05
Software Version:	WL INSITE R3.8.0 (Build 2)	Calibration Version:	1

Logging Source S/N: 5471GW

Aluminum Block S/N: 63066

Density: 2.602g/cc

Pe: 3.100

Magnesium Block S/N: 12345

Density: 1.690g/cc

Pe: 2.650

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0419	1.0779	0.90 - 1.10
Near Dens Gain	1.0185	1.0419	0.90 - 1.10
Near Peak Gain	0.9996	1.0320	0.90 - 1.10
Near Lith Gain	0.9519	0.9742	0.90 - 1.10
Far Bar Gain	1.0085	1.0155	0.90 - 1.10
Far Dens Gain	0.9963	1.0031	0.90 - 1.10
Far Peak Gain	0.9898	0.9957	0.90 - 1.10
Far Lith Gain	0.9775	0.9801	0.90 - 1.10
Near Bar Offset	-0.4536	-0.7889	NONE
Near Dens Offset	-0.2221	-0.4308	NONE
Near Peak Offset	-0.0469	-0.3206	NONE
Near Lith Offset	0.3473	0.1648	NONE
Far Bar Offset	-0.1713	-0.2319	NONE
Far Dens Offset	-0.0469	-0.1070	NONE
Far Peak Offset	0.2227	0.2472	NONE
Far Lith Offset	0.1713	0.2319	NONE

Far Peak Offset	-0.0027	-0.0472	NONE
Far Lith Offset	0.1064	0.0924	NONE
Near Bar Background	843.65	845.55	700 - 1450
Near Dens Background	279.64	281.24	230 - 480
Near Peak Background	121.57	121.51	100 - 210
Near Lith Background	148.61	148.94	125 - 260
Far Bar Background	661.07	658.01	450 - 900
Far Dens Background	261.61	260.86	175 - 345
Far Peak Background	102.88	102.40	70 - 140
Far Lith Background	105.28	105.83	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.690	1.690	0.000	+/- 0.015
Pe	2.634	2.598	-0.036	+/- 0.150
ALUMINUM				
Density (g/cc)	2.601	2.602	0.001	+/- 0.01500
Pe	3.095	3.057	-0.038	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0000	+/- 0.0110	-0.0003	+/- 0.0140
Magnesium Block	-0.0010	+/- 0.0110	-0.0011	+/- 0.0140
Aluminum Block	-0.0010	+/- 0.0110	0.0017	+/- 0.0140
Resolution	8.71	6.00 - 11.50	8.95	6.00 - 11.50
Internal Verifier(B+D+P+L)	1397	1200 - 2700	1127	800 - 1700

PASS/FAIL SUMMARY	
Background Quality Check:	Passed
Background Range Check:	Passed
Background Resolution Check:	Passed
Background Verification Check:	Passed
Magnesium Quality Check:	Passed
Aluminum Quality Check:	Passed
Gains Check:	Passed
Changes in Calibration Blocks:	Passed

### SPECTRAL DENSITY FIELD CHECK

Tool Name: SDLT Pad - 11795867

Reference Calibration Date: 19-Nov-12 10:39:05

Engineer: R. TWEETEN

Calibration Date: 14-Dec-12 01:12:50

Software Version: WL INSITE R3.8.0 (Build 2)

Calibration Version: 1

Pad Temperature: 42.8 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1397.239	1395.011	-2.228	15.097
Far (B+D+P+L) cps	1127.086	1125.254	-1.832	17.661
Near Resolution	8.71	8.80	0.090	0.50

Near Resolution		8.71	8.80	0.090	0.90
Far Resolution		8.95	9.08	0.130	1.00
PASS/FAIL SUMMARY					
Bkg Quality Check:			Passed		
Bkg Resolution Check:			Passed		
Bkg Verification Check:			Passed		

SDLT CALIPER FIELD CALIBRATION					
Tool Name:	SDLT - 11812177			Reference Calibration Date:	19-Nov-12 11:08:51
Engineer:	R. TWEETEN			Calibration Date:	14-Dec-12 01:20:29
Software Version:	WL INSITE R3.8.0 (Build 2)			Calibration Version:	1

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.71	-0.04	+/- 0.10
Ring Diameter	8.25	8.12	-0.13	+/- 0.15
PASS/FAIL SUMMARY				
Pad Extension Check:			Passed	
Diameter Check:			Passed	

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION					
Tool Name:	ACRt Sonde - 11294353			Reference Calibration Date:	23-Oct-12 16:37:36
Engineer:	J SCHMIDT			Calibration Date:	29-Nov-12 15:10:41
Software Version:	WL INSITE R3.4.4 (Build 2)			Calibration Version:	1
Host Tool Name:	ACRt Instrument - 11302817				

TYPICAL GAIN RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.01	1.05	0.95	1.01	1.05	0.95	1.01	1.05
A2 (50")	0.95	1.06	1.05	0.95	1.06	1.05	0.95	1.06	1.05
A3 (29")	0.95	1.01	1.05	0.95	1.01	1.05	0.95	1.01	1.05
A4 (17")	0.95	1.03	1.05	0.95	1.03	1.05	0.95	1.03	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.01	1.05	0.95	1.01	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.99	1.05	0.95	0.99	1.05

TYPICAL SONDE OFFSET RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-5	-0.56	2	-6	-4.45	-2	-8	-5.07	-2
A2 (50")	-7	-1.23	0	-7	-2.91	0	-7	-4.99	0
A3 (29")	-27	-12.69	-9	-9	-3.43	-3	-7	-3.70	-1
A4 (17")	-180	-91.43	-60	-45	-29.14	-15	-39	-25.11	-13
A5 (10")	N/A	N/A	N/A	-150	-99.10	-50	-80	-47.75	-10
A6 (6")	N/A	N/A	N/A	175	346.17	525	90	174.99	270

TRANSMITTER CURRENT GAIN				R-MUD VERIFICATION			
Signal	Lower	R	Upper	Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
12K	0.6	0.89	1.3	Mud Cell	0.95	1.00	1.05
36K	1.0	1.84	2.0				

PASS/FAIL SUMMARY	
GAIN RANGE CHK	FAIL
SONDE OFFSET RANGE CHK	PASS
Tx CURRENT GAIN	PASS
Rmud VERIFICATION	PASS

TOOL OUT OF TOLERANCE

CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11277436						
Gamma Ray Calibrator	247.3	249.1	-----	-1.8	+/- 9.00	api
DSNT-11812167						
Snow-Block Porosity	0.0754	0.0747	-----	0.0007	+/- 0.0150	decp
SDLT-11812177						
Pad Extension	3.75	3.71	-----	0.04	+/-0.10	in
Ring Diameter	8.25	8.12	-----	0.13	+/-0.15	in
SDLT Pad-11795867						
Near(B+D+P+L)	1397.239	1395.011	-----	2.228	+/-15.097	cps
Far(B+D+P+L)	1127.086	1125.254	-----	1.832	+/-17.661	cps
ACRt Sonde-11294353						
Mud Cell	1.00	-----	-----	0.00	-----	ohm-m
Data: JEANIE_AB10-01R\0001 TRIPLE-CSNG-HFDT-ICTIDLE					Date: 14-Dec-12 13:35:03	

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
RWCH-10409638 135.00 lbs		Ø 3.625 in →		← Load Cell @ 94.27 ft ← BH Temperature @ 93.70 ft	6.25 ft	97.95 ft
GTET-11277436 165.00 lbs		Ø 3.625 in →		← GammaRay @ 85.64 ft	8.52 ft	91.70 ft
CSNG-10846351 114.00 lbs		Ø 3.625 in →		← CSNG @ 77.56 ft	8.17 ft	83.18 ft

UnivWearRing3.6-  
11568969  
5.00 lbs

Ø 4.200 in\* →

75.02 ft

DSN Decentralizer-  
11812167  
6.60 lbs

Ø 5.000 in\* →

Ø 3.625 in →

9.69 ft

DSNT-11812167  
174.00 lbs

← DSN Far @ 68.08 ft  
← DSN Near @ 67.33 ft

65.33 ft

SDLT-11812177  
360.00 lbs

Ø 4.500 in →

Ø 4.750 in\* →

10.81 ft

SDLT Pad-11795867  
65.00 lbs

← SDL Caliper @ 57.33 ft  
← SDL @ 57.32 ft

54.52 ft

HFDT-I-90259473  
435.00 lbs

Ø 4.500 in →

Ø 4.750 in →

16.14 ft

Receiver Upper @ 41.54 ft  
HFDT-I Receiver @ 41.44 ft  
Receiver Middle @ 41.44 ft  
HFDT Microlog @ 41.38 ft  
Receiver Lower @ 41.34 ft  
HFDT-I Caliper @ 41.20 ft  
HFDT-I Pad @ 40.66 ft

38.38 ft

Flex Joint -  
Pressure Comp-  
12001606  
140.00 lbs

Ø 3.625 in →

5.97 ft

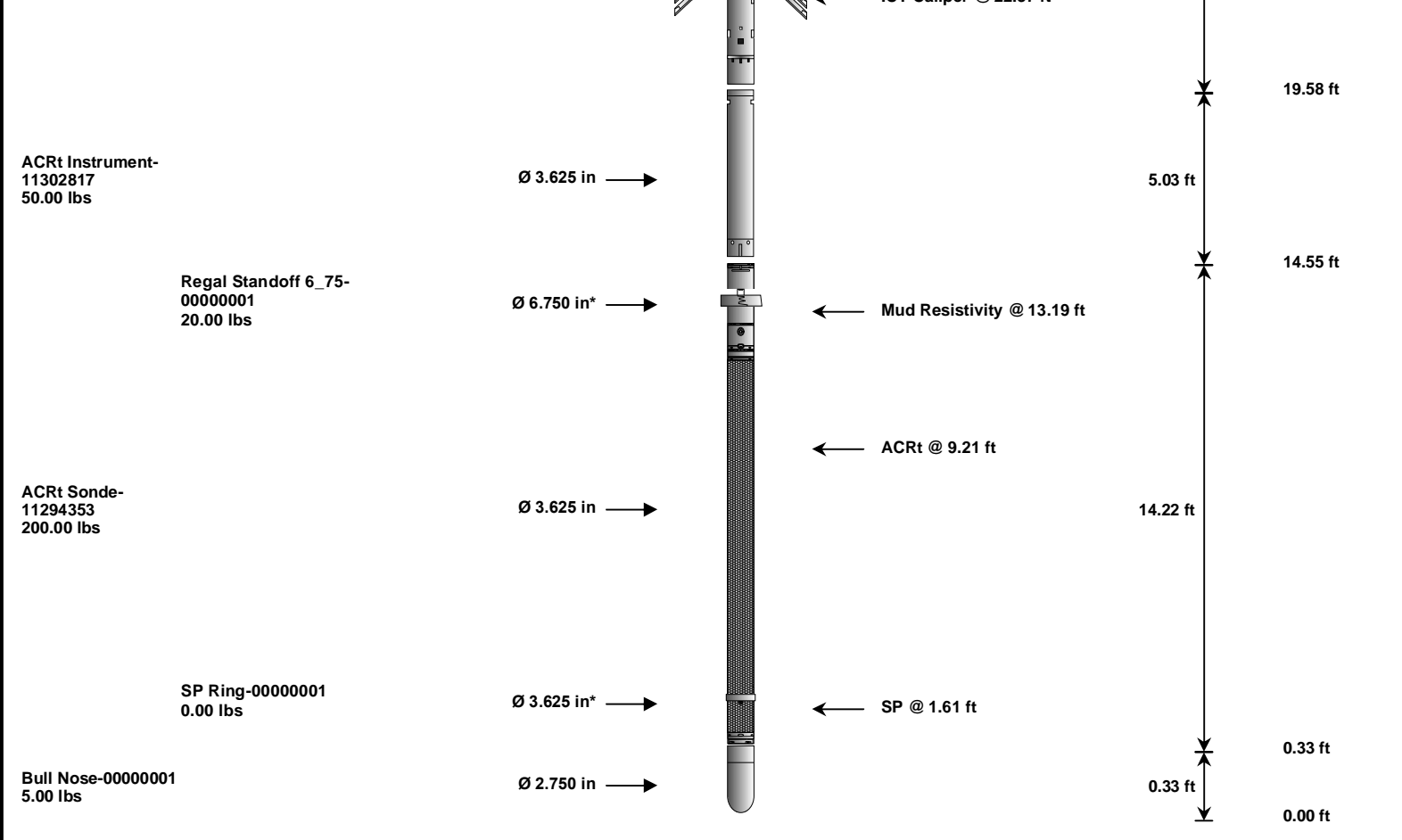
32.41 ft

ICT-11294351  
330.00 lbs

Ø 3.625 in →

12.83 ft

← ICT Caliper @ 22.37 ft



Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head		10409638	135.00	6.25	91.70	300.00
GTET	Gamma Telemetry Tool		11277436	165.00	8.52	83.18	60.00
CSNG	Compensated Spectral Natural Gamma		10846351	114.00	8.17	75.02	15.00
UWR3P6	Universal Wear Ring 3 5-8 inch		11568969	5.00	0.35	* 75.45	300.00
DSNT	Dual Spaced Neutron		11812167	174.00	9.69	65.33	60.00
DCNT	DSN Decentralizer		11812167	6.60	5.13	* 68.66	300.00
SDLT	Spectral Density Tool		11812177	360.00	10.81	54.52	60.00
SDLP	Density Insite Pad		11795867	65.00	2.55	* 56.73	60.00
HFDT	High Frequency Dielectric Tool		90259473	435.00	16.14	38.38	30.00
FLEX	Flex Joint - Pressure Compensated		12001606	140.00	5.97	32.41	300.00
ICT	Six Independent Arm Caliper		11294351	330.00	12.83	19.58	30.00
ACRt	Array Compensated True Resistivity Instrument Section		11302817	50.00	5.03	14.55	300.00
ACRt	Array Compensated True Resistivity Sonde Section		11294353	200.00	14.22	0.33	300.00
SP	SP Ring		00000001	0.00	0.25	* 1.61	300.00
RSOF	Regal Standoff 6.75in		00000001	20.00	0.52	* 13.18	300.00
BLNS	Bull Nose		00000001	5.00	0.33	0.00	300.00
Total				2,204.60	97.95		
* Not included in Total Length and Length Accumulation.							
Data: JEANIE_AB10-01R\0001 TRIPLE-CSNG-HFDT-ICT\IDLE							
Date: 14-Dec-12 10:47:09							

COMPANY	NOBLE ENERGY INC				
WELL	JEANIE AB10-01R				
FIELD	TOM CAT				
COUNTY	WELD	STATE	CO		

VALUATION	ARRAY COMPENSATED TRUE RESISTIVITY
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